

NASA Scientific and Technical Publications

A Catalog
of
*Special Publications,
Reference Publications,
Conference Publications, and
Technical Papers*

1987

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CONFERENCE PUBLICATIONS, AND TECHNICAL
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NASA Scientific and Technical Publications

A Catalog
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Special Publications,
Reference Publications,
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Scientific and Technical Information Division 1988
National Aeronautics and Space Administration
Washington, DC

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PREFACE

The pursuit of human knowledge through scientific research and technical endeavor has vastly expanded understanding of our world and the universe we live in. The contributions of NASA through scientific and technical research and development affect not only our understanding and use of aeronautics and space but also touch our daily lives. Geologists, oceanographers, meteorologists, archeologists, aircraft engineers, aerospace decision makers, land-use planners, historians, and rescue teams all make use of the results of NASA's research. The findings of this research and development are published in NASA's scientific and technical report series as a part of NASA's mandate to disseminate the results of the agency's far-reaching work.

This catalog provides a list of NASA publications from four report series entered into the NASA scientific and technical information database during accession year 1987. *Records of Achievement*, NASA SP-470 (accession number N83-33792) and *NASA Scientific and Technical Publications: A Catalog of Special Publications, Reference Publications, Conference Publications, and Technical Papers, 1977-1986*, NASA SP-7063(01) (accession number N87-30218) list previous NASA publications not covered by this catalog. Two semimonthly abstract journals cover all aspects of aeronautics and space research, NASA and non-NASA, nationally and worldwide: *STAR (Scientific and Technical Aerospace Reports)*, which focuses on scientific and technical reports, and *IAA (International Aerospace Abstracts)*, which covers the open literature. These are available by subscription from, respectively, the U.S. Government Printing Office and the American Institute of Aeronautics and Astronautics, Inc., (see below).

This catalog includes publicly available reports from four NASA report series: Special Publications (SPs), Reference Publications (RPs), Conference Publications (CPs), and Technical Papers (TPs). The scope of each series is defined as follows:

Special Publications are often concerned with subjects of substantial public interest. They report scientific and technical information derived from NASA programs for audiences of diverse technical backgrounds.

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Conference Publications record the proceedings of scientific and technical symposia and other professional meetings sponsored or cosponsored by NASA.

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Presented here are citations for reports from each of these series. An explanation of the elements in a typical citation follows. Accession numbers (N numbers) at the end of a citation are separate citations to articles within the report. Please use *STAR* to locate these citations. Also note that some bibliographies in the NASA SP-7000 series are issued periodically. This catalog lists only the last accessioned report in each bibliography series. The periodicity of each bibliography is as follows:

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ACCESSION NUMBER → N87-11916*# National Aeronautics and Space Administration. ← CORPORATE SOURCE
Wallops Flight Center, Wallops Island, Va.
TITLE → PULSE CODE MODULATION (PCM) ENCODER HANDBOOK FOR
AYDIN VECTOR MMP-600 SERIES SYSTEM
AUTHORS → S. F. CURRIER and W. R. POWELL Washington, D.C. Aug. ← PUBLICATION DATE
1986 139 p
REPORT NUMBERS → (NASA-RP-1171; NAS 1.61:1171) Avail: NTIS HC A07/MF A01 ← PRICE CODE
COSATI CODE → CSCL 17B ← AVAILABILITY SOURCE

The hardware and software characteristics of a time division multiplex system are described. The system is used to sample analog and digital data. The data is merged with synchronization information to produce a serial pulse coded modulation (PCM) bit stream. Information presented herein is required by users to design compatible interfaces and assure effective utilization of this encoder system. GSFC/Wallops Flight Facility has flown approximately 50 of these systems through 1984 on sounding rockets with no inflight failures. Aydin Vector manufactures all of the components for these systems.
Author

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ACCESSION NUMBER → N87-22604*# National Aeronautics and Space Administration. ← CORPORATE SOURCE
Langley Research Center, Hampton, Va.
TITLE → JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION
RESEARCH, 1984
AUTHOR → FREDERICK R. MORRELL, comp. May 1987 165 p Meeting
held in Hampton, Va., 18 Jan. 1985
REPORT NUMBERS → (NASA-CP-2452; L-16255; NAS 1.55:2452) Avail: NTIS HC ← AVAILABILITY SOURCE
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Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer*.

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Includes passenger and cargo air transport operations; and aircraft accidents.

For related information see also *16 Space Transportation* and *85 Urban Technology and Transportation*.

04 AIRCRAFT COMMUNICATIONS AND NAVIGATION	N.A.
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Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Space Communications, Spacecraft Communications, Command and Tracking* and *32 Communications and Radar*.

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Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

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For related information see also *20 Spacecraft Propulsion and Power*, *28 Propellants and Fuels*, and *44 Energy Production and Conversion*.

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Includes aircraft handling qualities; piloting; flight controls; and autopilots.

For related information see also *05 Aircraft Design, Testing and Performance*.

09 RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

For related information see also *14 Ground Support Systems and Facilities (Space)*.

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; space communications, spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

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For related information see also *09 Research and Support Facilities (Air)*.

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For related information see also *20 Spacecraft Propulsion and Power*.

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For related information see also *04 Aircraft Communications and Navigation* and *32 Communications and Radar*.

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For life support systems see <i>54 Man/System Technology and Life Support</i> . For related information see also <i>05 Aircraft Design, Testing and Performance</i> , <i>39 Structural Mechanics</i> , and <i>16 Space Transportation</i> .	
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Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT	N.A.
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Includes human engineering; biotechnology; and space suits and protective clothing.

For related information see also 16 *Space Transportation*.

55 SPACE BIOLOGY

N.A.

Includes exobiology; planetary biology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL)	N.A.
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60 COMPUTER OPERATIONS AND HARDWARE	N.A.
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Includes hardware for computer graphics, firmware, and data processing.

For components see 33 *Electronics and Electrical Engineering*.

61 COMPUTER PROGRAMMING AND SOFTWARE	22
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Includes computer programs, routines, algorithms, and specific applications, e.g., CAD/CAM.

62 COMPUTER SYSTEMS	22
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Includes computer networks and special application computer systems.

63 CYBERNETICS	N.A.
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Includes feedback and control theory, artificial intelligence, robotics and expert systems.

For related information see also 54 *Man/System Technology and Life Support*.

64 NUMERICAL ANALYSIS	22
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Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY	23
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Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS	N.A.
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Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS	N.A.
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Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.

For related information see also *Engineering*.

70 PHYSICS (GENERAL)	N.A.
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For precision time and time interval (PTTI) see 35 *Instrumentation and Photography*; for geophysics, astrophysics or solar physics see 46 *Geophysics*, 90 *Astrophysics*, or 92 *Solar Physics*.

71 ACOUSTICS	23	Includes sound generation, transmission, and attenuation. For noise pollution see <i>45 Environment Pollution</i> .
72 ATOMIC AND MOLECULAR PHYSICS	N.A.	Includes atomic structure, electron properties, and molecular spectra.
73 NUCLEAR AND HIGH-ENERGY PHYSICS	24	Includes elementary and nuclear particles; and reactor theory. For space radiation see <i>93 Space Radiation</i> .
74 OPTICS	24	Includes light phenomena and optical devices. For lasers see <i>36 Lasers and Masers</i> .
75 PLASMA PHYSICS	24	Includes magnetohydrodynamics and plasma fusion. For ionospheric plasmas see <i>46 Geophysics</i> . For space plasmas see <i>90 Astrophysics</i> .
76 SOLID-STATE PHYSICS	N.A.	Includes superconductivity. For related information see also <i>33 Electronics and Electrical Engineering</i> and <i>36 Lasers and Masers</i> .
77 THERMODYNAMICS AND STATISTICAL PHYSICS	N.A.	Includes quantum mechanics; theoretical physics; and Bose and Fermi statistics. For related information see also <i>25 Inorganic and Physical Chemistry</i> and <i>34 Fluid Mechanics and Heat Transfer</i> .
SOCIAL SCIENCES		
Includes social sciences (general); administration and management; documentation and information science; economics and cost analysis; law, political science, and space policy; and urban technology and transportation.		
80 SOCIAL SCIENCES (GENERAL)	N.A.	Includes educational matters.
81 ADMINISTRATION AND MANAGEMENT	24	Includes management planning and research.
82 DOCUMENTATION AND INFORMATION SCIENCE	24	Includes information management; information storage and retrieval technology; technical writing; graphic arts; and micrography. For computer documentation see <i>61 Computer Programming and Software</i> .
83 ECONOMICS AND COST ANALYSIS	N.A.	Includes cost effectiveness studies.
Note: N.A. means that no abstracts were assigned to this category for this issue.		
SUBJECT INDEX	A-1	
PERSONAL AUTHOR INDEX	B-1	
REPORT NUMBER INDEX	C-1	

84 LAW, POLITICAL SCIENCE AND SPACE POLICY N.A.
 Includes NASA appropriation hearings; aviation law; space law and policy; international law; international cooperation; and patent policy.

85 URBAN TECHNOLOGY AND TRANSPORTATION 25
 Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.
 For related information see *03 Air Transportation and Safety*, *16 Space Transportation*, and *44 Energy Production and Conversion*.

SPACE SCIENCES

Includes space sciences (general); astronomy; astrophysics; lunar and planetary exploration; solar physics; and space radiation.

For related information see also *Geosciences*.

88 SPACE SCIENCES (GENERAL) 25

89 ASTRONOMY 25
 Includes radio, gamma-ray, and infrared astronomy; and astrometry.

90 ASTROPHYSICS 26
 Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust.
 For related information see also *75 Plasma Physics*.

91 LUNAR AND PLANETARY EXPLORATION 26
 Includes planetology; and manned and unmanned flights.

For spacecraft design or space stations see *18 Spacecraft Design, Testing and Performance*.

92 SOLAR PHYSICS 26
 Includes solar activity, solar flares, solar radiation and sunspots.
 For related information see *93 Space Radiation*.

93 SPACE RADIATION 27
 Includes cosmic radiation; and inner and outer earth's radiation belts.
 For biological effects of radiation see *52 Aerospace Medicine*. For theory see *73 Nuclear and High-Energy Physics*.

GENERAL

Includes aeronautical, astronautical, and space science related histories, biographies, and pertinent reports too broad for categorization; histories or broad overviews of NASA programs.

99 GENERAL 27

01

AERONAUTICS (GENERAL)

N87-18520*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1983

FREDERICK R. MORRELL, comp. Mar. 1987 80 p Conference held in Atlantic City, N.J., 16 Dec. 1983; sponsored by NASA and FAA
(NASA-CP-2451; L-16254; NAS 1.55:2451) Avail: NTIS HC A05/MF A01 CSCL 01B

AIR NAVIGATION, AIR TRANSPORTATION, AIRCRAFT GUIDANCE, AVIONICS, CONFERENCES, FLIGHT CONTROL

N87-22604*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1984

FREDERICK R. MORRELL, comp. May 1987 165 p Meeting held in Hampton, Va., 18 Jan. 1985
(NASA-CP-2452; L-16255; NAS 1.55:2452) Avail: NTIS HC A08/MF A01 CSCL 01B

AIR TRANSPORTATION, AIRCRAFT CONTROL, AIRCRAFT GUIDANCE, AVIONICS, CONTROL THEORY, SURFACE NAVIGATION

N87-25267*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

WIND SHEAR/TURBULENCE INPUTS TO FLIGHT SIMULATION AND SYSTEMS CERTIFICATION

ROLAND L. BOWLES, ed. and WALTER FROST, ed. (FWG Associates, Inc., Tullahoma, Tenn.) Jul. 1987 272 p Workshop held in Hampton, Va., 30 May - 1 Jun. 1984
(NASA-CP-2474; L-16329; NAS 1.55:2474) Avail: NTIS HC A12/MF A01 CSCL 01B

AIRCRAFT PERFORMANCE, AVIONICS, FLIGHT SAFETY, FLIGHT SIMULATION, PILOT PERFORMANCE, WIND SHEAR

N87-27596*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

JOINT UNIVERSITY PROGRAM FOR AIR TRANSPORTATION RESEARCH, 1985

FREDERICK R. MORRELL, comp. Jul. 1987 100 p Conference held in Atlantic City, N.J., 30 Jan. 1986
(NAS 1.55:2453; NASA-CP-2453) Avail: NTIS HC A05/MF A01 CSCL 01B

AIR TRAFFIC CONTROL, AIR TRANSPORTATION, CONFERENCES, FAULT TOLERANCE, FLIGHT CONTROL, GLOBAL POSITIONING SYSTEM, INERTIAL NAVIGATION

N87-27613*# National Aeronautics and Space Administration, Washington, D.C.

AERONAUTICAL ENGINEERING: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 217)

Sep. 1987 134 p
(NASA-SP-7037(217); NAS 1.21:7037(217)) Avail: NTIS HC A07 CSCL 01B

This bibliography lists 450 reports, articles, and other documents introduced into the NASA scientific and technical information system in August, 1987. Author

02

AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

N87-10039*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

WIND-TUNNEL INVESTIGATION OF THE FLIGHT CHARACTERISTICS OF A CANARD GENERAL-AVIATION AIRPLANE CONFIGURATION

D. R. SATRAN Oct. 1986 60 p
(NASA-TP-2623; L-15929; NAS 1.60:2623) Avail: NTIS HC A04/MF A01 CSCL 01A

CANARD CONFIGURATIONS, FLIGHT CHARACTERISTICS, GENERAL AVIATION AIRCRAFT, WIND TUNNEL TESTS

N87-10042*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SUPERSONIC, NONLINEAR, ATTACHED-FLOW WING DESIGN FOR HIGH LIFT WITH EXPERIMENTAL VALIDATION

J. L. PITTMAN, D. S. MILLER, and W. H. MASON (Grumman Aerospace Corp., Bethpage, N.Y.) Aug. 1984 221 p
(NASA-TP-2336; L-15787; NAS 1.60:2336) Avail: NTIS HC A10/MF A01 CSCL 01A

CAMBERED WINGS, REATTACHED FLOW, SUPERCRITICAL FLOW, SUPERSONIC AIRFOILS, SUPERSONIC FLOW

N87-10838*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECTS OF TAIL SPAN AND EMPENNAGE ARRANGEMENT ON DRAG OF A TYPICAL SINGLE-ENGINE FIGHTER AFT END

J. R. BURLEY, II and B. L. BERRIER Sep. 1984 136 p
(NASA-TP-2352; L-15742; NAS 1.60:2352) Avail: NTIS HC A07/MF A01 CSCL 01A

AERODYNAMIC DRAG, AIRCRAFT CONFIGURATIONS, SKIN FRICTION, TAIL ASSEMBLIES, TRANSONIC SPEED

02 AERODYNAMICS

N87-10839*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STATIC INTERNAL PERFORMANCE OF SINGLE-EXPANSION-RAMP NOZZLES WITH THRUST-VECTORING CAPABILITY UP TO 60 DEG

B. L. BERRIER and L. D. LEAVITT Oct. 1984 144 p
(NASA-TP-2364; L-15766; NAS 1.60:2364) Avail: NTIS HC
A07/MF A01 CSCL 01A
AXISYMMETRIC BODIES, NOZZLE FLOW, THRUST VECTOR CONTROL

N87-10841*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

TRANSONIC FLOW ANALYSIS FOR ROTORS. PART 2: THREE-DIMENSIONAL, UNSTEADY, FULL-POTENTIAL CALCULATION

I. C. CHANG Jan. 1985 27 p
(NASA-TP-2375-PT-2; A-9682; NAS 1.60:2375-PT-2) Avail: NTIS HC
A03/MF A01 CSCL 01A
AERODYNAMIC STABILITY, HELICOPTER PERFORMANCE, ROTORS, TIP VANES, TRANSONIC FLOW

N87-10843*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PILOTED SIMULATION STUDY OF THE EFFECTS OF AN AUTOMATED TRIM SYSTEM ON FLIGHT CHARACTERISTICS OF A LIGHT TWIN-ENGINE AIRPLANE WITH ONE ENGINE INOPERATIVE

E. C. STEWART, P. W. BROWN, and K. R. YENNI Nov. 1986 41 p
(NASA-TP-2633; L-16147; NAS 1.60:2633) Avail: NTIS HC
A03/MF A01 CSCL 01A
AERODYNAMIC BALANCE, AUTOMATIC FLIGHT CONTROL, ENGINE FAILURE, LIGHT AIRCRAFT

N87-11702*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FORWARD-SWEPT WING CONFIGURATION DESIGNED FOR HIGH MANEUVERABILITY BY USE OF A TRANSONIC COMPUTATIONAL METHOD

M. J. MANN and C. E. MERCER Nov. 1986 185 p
(NASA-TP-2628; L-16120; NAS 1.60:2628) Avail: NTIS HC
A09/MF A01 CSCL 01A
AERODYNAMIC CONFIGURATIONS, HIGHLY MANEUVERABLE AIRCRAFT, SWEPT FORWARD WINGS, TRANSONIC SPEED

N87-12541*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECT OF PORT CORNER GEOMETRY ON THE INTERNAL PERFORMANCE OF A ROTATING-VANE-TYPE THRUST REVERSER

B. L. BERRIER and F. J. CAPONE Dec. 1986 51 p
(NASA-TP-2624; L-16135; NAS 1.60:2624) Avail: NTIS HC
A04/MF A01 CSCL 01A
CORNER FLOW, NOZZLE GEOMETRY, PORTS (OPENINGS), ROTATING BODIES, THRUST REVERSAL, VANES, WIND TUNNEL TESTS

N87-14284*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PROPAGATION OF SOUND WAVES IN TUBES OF NONCIRCULAR CROSS SECTION

W. B. RICHARDS (Oberlin Coll., Ohio) Aug. 1986 33 p
(NASA-TP-2601; E-2690; NAS 1.60:2601) Avail: NTIS HC
A03/MF A01 CSCL 01A

ELLIPTICAL CYLINDERS, PIPES (TUBES), SOUND WAVES, WAVE PROPAGATION

N87-15174*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

APPLICABILITY OF LINEARIZED-THEORY ATTACHED-FLOW METHODS TO DESIGN AND ANALYSIS OF FLAP SYSTEMS AT LOW SPEEDS FOR THIN SWEPT WINGS WITH SHARP LEADING EDGES

HARRY W. CARLSON and CHRISTINE M. DARDEN Jan. 1987 54 p
(NASA-TP-2653; L-16151; NAS 1.60:2653) Avail: NTIS HC
A04/MF A01 CSCL 01A

DESIGN ANALYSIS, FLAPS (CONTROL SURFACES), LINEARITY, LOW SPEED, SHARP LEADING EDGES, SWEPT WINGS, THIN WINGS, VORTEX FLAPS

N87-15183*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFICIENT SOLUTIONS TO THE EULER EQUATIONS FOR SUPERSONIC FLOW WITH EMBEDDED SUBSONIC REGIONS

ROBERT W. WALTERS and DOUGLAS L. DWYER Jan. 1987 18 p
(NASA-TP-2523; L-15975; NAS 1.60:2523) Avail: NTIS HC
A02/MF A01 CSCL 01A

EMBEDDING, EULER EQUATIONS OF MOTION, PROBLEM SOLVING, SUBSONIC FLOW, SUPERSONIC FLOW

N87-15184*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SUBSONIC MANEUVER CAPABILITY OF A SUPERSONIC CRUISE FIGHTER WING CONCEPT

GREGORY D. RIEBE and CHARLES H. FOX, JR. Jan. 1987 74 p
(NASA-TP-2642; L-16097; NAS 1.60:2642) Avail: NTIS HC
A04/MF A01 CSCL 01A

FIGHTER AIRCRAFT, MANEUVERS, SUBSONIC SPEED, SUPERSONIC CRUISE AIRCRAFT RESEARCH, WINGS

N87-17665*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PRELIMINARY DESIGN OF TURBOPUMPS AND RELATED MACHINERY

GEORGE F. WISLICENUS Oct. 1986 397 p
(NAS3-13475)
(NASA-RP-1170; E-7389; NAS 1.61:1170) Avail: NTIS HC
A17/MF A01 CSCL 01A

Pumps used in large liquid-fuel rocket engines are examined. The term preliminary design denotes the initial, creative phases of design, where the general shape and characteristics of the machine are determined. This compendium is intended to provide the design engineer responsible for these initial phases with a physical understanding and background knowledge of the numerous special fields involved in the design process. Primary attention is directed to the pumping part of the turbopump and hence is concerned with essentially incompressible fluids. However, compressible flow principles are developed. As much as possible, the simplicity and reliability of incompressible flow considerations are retained by treating the mechanics of compressible fluids as a departure from the theory of incompressible fluids. Five areas are discussed: a survey of the field of turbomachinery in dimensionless form; the theoretical principles of the hydrodynamic design of turbomachinery; the hydrodynamic and gas dynamic design of axial flow turbomachinery; the hydrodynamic and gas dynamic design of radial and mixed flow turbomachinery; and some mechanical design considerations of turbomachinery. Theoretical considerations are presented with a relatively elementary mathematical treatment.

Author

N87-17668*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**WIND-TUNNEL INVESTIGATION AT SUPERSONIC SPEEDS OF
A REMOTE-CONTROLLED CANARD MISSILE WITH A
FREE-ROLLING-TAIL BRAKE TORQUE SYSTEM**

A. B. BLAIR, JR. Mar. 1985 38 p
(NASA-TP-2401; L-15882; NAS 1.60:2401) Avail: NTIS HC

A03/MF A01 CSCL 01A

BRAKING, CANARD CONFIGURATIONS, FINS, MISSILE
CONFIGURATIONS, REMOTE CONTROL, ROLLING MOMENTS,
SUPERSONIC SPEED, TAIL ASSEMBLIES, TORQUE, WIND
TUNNEL TESTS

N87-17669*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**COMBINED AERODYNAMIC AND STRUCTURAL DYNAMIC
PROBLEM EMULATING ROUTINES (CASPER): THEORY AND
IMPLEMENTATION**

WILLIAM H. JONES Feb. 1985 75 p
(NASA-TP-2418; E-2278; NAS 1.60:2418) Avail: NTIS HC

A04/MF A01 CSCL 01A

AERODYNAMIC COEFFICIENTS, COMPUTATIONAL FLUID
DYNAMICS, COMPUTERIZED SIMULATION, DYNAMIC STRUC-
TURAL ANALYSIS

N87-18537*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**HELICOPTER BLADE-VORTEX INTERACTION LOCATIONS:
SCALE-MODEL ACOUSTICS AND FREE-WAKE ANALYSIS
RESULTS**

DANNY R. HOAD Apr. 1987 106 p
(DA PROJ. 1L1-62209-AH-76-A)
(NASA-TP-2658; L-16214; AVSCOM-TM-87-B-1; NAS 1.60:2658)
Avail: NTIS HC A06/MF A01 CSCL 01A

ACOUSTICS, BLADE-VORTEX INTERACTION, FREE FLOW,
HELICOPTERS, ROTORS, VORTICES, WAKES

N87-19351*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**NUMERICAL SIMULATION OF CHANNEL FLOW TRANSITION,
RESOLUTION REQUIREMENTS AND STRUCTURE OF THE
HAIRPIN VORTEX**

STEVEN E. KRIST (Joint Inst. for Advancement of Flight Sciences,
Hampton, Va.) and THOMAS A. ZANG Apr. 1987 71 p
(NASA-TP-2667; L-16204; NAS 1.60:2667) Avail: NTIS HC

A04/MF A01 CSCL 01A

BOUNDARY LAYER STABILITY, BOUNDARY LAYER
TRANSITION, BOUNDARY VALUE PROBLEMS, CHANNEL FLOW,
COMPUTATIONAL FLUID DYNAMICS, SPECTRAL METHODS

N87-20233*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**INVESTIGATION OF LEADING-EDGE FLAP PERFORMANCE ON
DELTA AND DOUBLE-DELTA WINGS AT SUPERSONIC
SPEEDS**

PETER F. COVELL, RICHARD M. WOOD, and DAVID S. MILLER
Apr. 1987 125 p
(NASA-TP-2656; L-16143; NAS 1.60:2656) Avail: NTIS HC

A06/MF A01 CSCL 01A

DELTA WINGS, EXPERIMENT DESIGN, LEADING EDGE
FLAPS, SUPERSONIC SPEED

N87-20238*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

LEWIS INVERSE DESIGN CODE (LINDES): USERS MANUAL

JOSE M. SANZ Mar. 1987 67 p
(NASA-TP-2676; E-3221; NAS 1.60:2676) Avail: NTIS HC

A04/MF A01 CSCL 01A

AIRFOILS, CODING, DESIGN ANALYSIS, HODOGRAPHS,
INVERSIONS, TURBINE BLADES, USER MANUALS (COMPUTER
PROGRAMS)

N87-20966*# National Aeronautics and Space Administration.
Hugh L. Dryden Flight Research Center, Edwards, Calif.
**IN-FLIGHT SURFACE OIL-FLOW PHOTOGRAPHS WITH
COMPARISONS TO PRESSURE DISTRIBUTION AND
BOUNDARY-LAYER DATA**

ROBERT R. MEYER, JR. and LISA A. JENNETH Apr. 1985
27 p Original contains color illustrations
(NASA-TP-2395; H-1184; NAS 1.60:2395) Avail: NTIS HC

A03/MF A01 CSCL 01A

BOUNDARY LAYER FLOW, FLOW VISUALIZATION,
IN-FLIGHT MONITORING, OILS, PHOTOGRAPHY, PRESSURE
DISTRIBUTION

N87-21855*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**WIND-TUNNEL FREE-FLIGHT INVESTIGATION OF A
0.15-SCALE MODEL OF THE F-106B AIRPLANE WITH VORTEX
FLAPS**

LONG P. YIP May 1987 46 p
(NASA-TP-2700; L-16202; NAS 1.60:2700) Avail: NTIS HC

A03/MF A01 CSCL 01A

F-106 AIRCRAFT, FREE FLIGHT, VORTEX FLAPS, WIND
TUNNEL MODELS, WIND TUNNEL TESTS

N87-21871*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**NEW METHODS AND RESULTS FOR QUANTIFICATION OF
LIGHTNING-AIRCRAFT ELECTRODYNAMICS**

FELIX L. PITTS, LARRY D. LEE, RODNEY A. PERALA, and
TERENCE H. RUDOLPH (Electro Magnetic Applications, Inc.,
Lakewood, Colo.) Jun. 1987 67 p
(NASA-TP-2737; L-16281; NAS 1.60:2737) Avail: NTIS HC

A04/MF A01 CSCL 01A

ELECTRODYNAMICS, F-106 AIRCRAFT, FLIGHT TESTS,
LIGHTNING, RESEARCH AIRCRAFT

N87-21873*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**EFFECTS OF AFTERBODY BOATTAIL DESIGN AND
EMPENNAGE ARRANGEMENT ON AEROPROPULSIVE CHAR-
ACTERISTICS OF A TWIN-ENGINE FIGHTER MODEL AT TRANS-
ONIC SPEEDS**

LINDA S. BANGERT, LAURENCE D. LEAVITT, and DAVID E.
REUBUSH Jun. 1987 134 p
(NASA-TP-2704; L-16227; NAS 1.60:2704) Avail: NTIS HC

A07/MF A01 CSCL 01A

AFTEROBODIES, AXISYMMETRIC FLOW, BOATTAILS, DRAG,
FIGHTER AIRCRAFT, NOZZLES, PROPULSIVE EFFICIENCY,
TAIL ASSEMBLIES

N87-22626*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**EXPERIMENTAL CAVITY PRESSURE DISTRIBUTIONS AT
SUPERSONIC SPEEDS**

ROBERT L. STALLINGS, JR. and FLOYD J. WILCOX, JR. Jun.
1987 79 p
(NASA-TP-2683; L-16215; NAS 1.60:2683) Avail: NTIS HC

A05/MF A01 CSCL 01A

CAVITIES, FLUID FLOW, PRESSURE DISTRIBUTION,
SUPERSONIC SPEED

N87-23586*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**ON MINIMIZING THE NUMBER OF CALCULATIONS IN
DESIGN-BY-ANALYSIS CODES**

RAYMOND L. BARGER and ANUTOSH MOITRA Jun. 1987
16 p
(NASA-TP-2706; L-16226; NAS 1.60:2706) Avail: NTIS HC

A02/MF A01 CSCL 01A

AERODYNAMIC CONFIGURATIONS, APPROXIMATION,
DESIGN ANALYSIS, NUMERICAL ANALYSIS, PRESSURE
DISTRIBUTION

02 AERODYNAMICS

N87-23592*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MACH 6 EXPERIMENTAL AND THEORETICAL STABILITY AND PERFORMANCE OF A CRUCIFORM MISSILE AT ANGLES OF ATTACK UP TO 65 DEGREES

EDWARD R. HARTMAN (Arnold Engineering Development Center, Arnold Air Force Station, Tenn.) and PATRICK J. JOHNSTON Jul. 1987 41 p
(NASA-TP-2733; L-16287; NAS 1.60:2733) Avail: NTIS HC A03/MF A01 CSCL 01A

ANGLE OF ATTACK, CRUCIFORM WINGS, EXPERIMENTATION, HYPERSONIC SPEED, MACH NUMBER, MISSLES

N87-23593*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECT OF A TRADE BETWEEN BOATTAIL ANGLE AND WEDGE SIZE ON THE PERFORMANCE OF A NONAXISYMMETRIC WEDGE NOZZLE

GEORGE T. CARSON, JR., E. ANN BARE, and JAMES R. BURLEY, II Jul. 1987 67 p
(NASA-TP-2717; L-16248; NAS 1.60:2717) Avail: NTIS HC A04/MF A01 CSCL 01A

AXISYMMETRIC BODIES, BOATTAILS, NOZZLE GEOMETRY, PERFORMANCE TESTS, TRADEOFFS, WEDGES

N87-23597*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STUDY OF LEE-SIDE FLOWS OVER CONICALLY CAMBERED DELTA WINGS AT SUPERSONIC SPEEDS, PART 1

RICHARD M. WOOD and CAROLYN B. WATSON Jul. 1987 212 p
(NASA-TP-2660-PT-1; L-16192; NAS 1.60:2660-PT-1) Avail: NTIS HC A10/MF A01 CSCL 01A

CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, LEE WAVES, STRUCTURAL DESIGN, SUPERSONIC FLOW, VORTICES

N87-24410*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PROCEEDINGS OF THE 1985 NASA AMES RESEARCH CENTER'S GROUND-EFFECTS WORKSHOP

KERRY MITCHELL, ed. Feb. 1987 448 p Workshop held at Moffett Field, Calif., 20-21 Aug. 1985
(NASA-CP-2462; A-86391; NAS 1.55:2462) Avail: NTIS HC A19/MF A01 CSCL 01A

GROUND EFFECT (AERODYNAMICS), INGESTION (ENGINES), POWERED LIFT AIRCRAFT, V/STOL AIRCRAFT, VERTICAL LANDING

N87-24432*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STATIC INTERNAL PERFORMANCE OF A TWO-DIMENSIONAL CONVERGENT-DIVERGENT NOZZLE WITH THRUST VECTORING

E. ANN BARE and DAVID E. REUBUSH Jul. 1987 115 p
(NASA-TP-2721; L-16240; NAS 1.60:2721) Avail: NTIS HC A06/MF A01 CSCL 01A

CONVERGENT-DIVERGENT NOZZLES, STATIC TESTS, THRUST VECTOR CONTROL, TWO DIMENSIONAL FLOW

N87-24433*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MULTIAxis CONTROL POWER FROM THRUST VECTORING FOR A SUPERSONIC FIGHTER AIRCRAFT MODEL AT MACH 0.20 TO 2.47

FRANCIS J. CAPONE and E. ANN BARE Jul. 1987 264 p
(NASA-TP-2712; L-16213; NAS 1.60:2712) Avail: NTIS HC A12/MF A01 CSCL 01A

FIGHTER AIRCRAFT, MACH NUMBER, SUPERSONIC CRUISE AIRCRAFT RESEARCH, THRUST VECTOR CONTROL

N87-25301*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STUDY OF LEE-SIDE FLOWS OVER CONICALLY CAMBERED DELTA WINGS AT SUPERSONIC SPEEDS, PART 2

RICHARD M. WOOD and CAROLYN B. WATSON Jul. 1987 404 p
(NASA-TP-2660-PT-2; L-16192; NAS 1.60:2660-PT-2) Avail: NTIS HC A18/MF A01 CSCL 01A

CONICAL CAMBER, DELTA WINGS, FLOW DISTRIBUTION, FLOW VISUALIZATION, SUPERSONIC FLOW, WING LOADING

N87-25998*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SUPERCOMPUTING IN AEROSPACE

PAUL KUTLER and HELEN YEE Mar. 1987 299 p Symposium held at Moffett Field, Calif., 10-12 Mar. 1987
(NASA-CP-2454; A-87082; NAS 1.55:2454) Avail: NTIS HC A13/MF A01 CSCL 01A

COMPUTATIONAL ASTROPHYSICS, COMPUTATIONAL CHEMISTRY, COMPUTATIONAL FLUID DYNAMICS, COMPUTATIONAL GRIDS, COMPUTERIZED SIMULATION, CONFERENCES, INTERACTIONAL AERODYNAMICS, NAVIER-STOKES EQUATION, SUPERCOMPUTERS

N87-26031*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECT OF REYNOLDS NUMBER VARIATION ON AERODYNAMICS OF A HYDROGEN-FUELED TRANSPORT CONCEPT AT MACH 6

JIM A. PENLAND and DON C. MARCUS, JR. Aug. 1987 28 p
(NASA-TP-2728; L-16286; NAS 1.60:2728) Avail: NTIS HC A03/MF A01 CSCL 01A

AERODYNAMIC CONFIGURATIONS, HYDROGEN FUELS, HYPERSONIC AIRCRAFT, MACH NUMBER, REYNOLDS NUMBER, TRANSPORT AIRCRAFT

N87-26032*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

STEADY AND UNSTEADY AERODYNAMIC FORCES FROM THE SOUSSA SURFACE-PANEL METHOD FOR A FIGHTER WING WITH TIP MISSILE AND COMPARISON WITH EXPERIMENT AND PANAIR

HERBERT J. CUNNINGHAM Aug. 1987 29 p
(NASA-TP-2736; L-16262; NAS 1.60:2736) Avail: NTIS HC A03/MF A01 CSCL 01A

AERODYNAMIC FORCES, FIGHTER AIRCRAFT, PANEL METHOD (FLUID DYNAMICS), UNSTEADY FLOW, WINGS

N87-26874*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SUBSONIC LONGITUDINAL AND LATERAL-DIRECTIONAL CHARACTERISTICS OF A FORWARD-SWEPT-WING FIGHTER CONFIGURATION AT ANGLES OF ATTACK UP TO 47 DEG

MICHAEL J. MANN, JARRETT K. HUFFMAN, and CHARLES H. FOX, JR. Sep. 1987 103 p
(NASA-TP-2727; L-16206; NAS 1.60:2727) Avail: NTIS HC A06/MF A01 CSCL 01A

AERODYNAMIC CONFIGURATIONS, ANGLE OF ATTACK, FIGHTER AIRCRAFT, LATERAL CONTROL, LATERAL STABILITY, SUBSONIC AIRCRAFT, SWEPT FORWARD WINGS

N87-26883*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AN EXPERIMENTAL INVESTIGATION OF AN ADVANCED TURBOPROP INSTALLATION ON A SWEPT WING AT SUBSONIC AND TRANSONIC SPEEDS

JOHN R. CARLSON and ODIS C. PENDERGRAFT, JR. Sep. 1987 242 p
(NASA-TP-2729; L-16043; NAS 1.60:2729) Avail: NTIS HC A11/MF A01 CSCL 01A

AERODYNAMICS, ENGINE AIRFRAME INTEGRATION, SUBSONIC SPEED, SWEPT WINGS, TRANSONIC SPEED, TURBOPROP ENGINES

N87-27622*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**CALCULATION OF VISCOUS EFFECTS ON TRANSONIC FLOW
FOR OSCILLATING AIRFOILS AND COMPARISONS WITH
EXPERIMENT**
JAMES T. HOWLETT and SAMUEL R. BLAND Sep. 1987
77 p
(NASA-TP-2731; L-16289; NAS 1.60:2731) Avail: NTIS HC
A05/MF A01 CSCL 01A
AEROFOILS, COMPARISON, INVISCID FLOW, OSCILLATIONS,
TRANSONIC FLOW, VISCOUS FLOW

N87-27626*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**DRAG MEASUREMENTS OF BLUNT STORES TANGENTIALLY
MOUNTED ON A FLAT PLATE AT SUPERSONIC SPEEDS**
FLOYD J. WILCOX, JR. Sep. 1987 68 p
(NASA-TP-2742; L-16284; NAS 1.60:2742) Avail: NTIS HC
A04/MF A01 CSCL 01A
AERODYNAMIC DRAG, BLUNT BODIES, EXTERNAL STORES,
FLAT PLATES, MOUNTING, SUPERSONIC SPEED, TANGENTS

N87-27643*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**PRESSURE MEASUREMENTS ON A THICK CAMBERED AND
TWISTED 58 DEG DELTA WING AT HIGH SUBSONIC SPEEDS**
JULIO CHU and JOHN E. LAMAR Sep. 1987 233 p
(NASA-TP-2713; L-16224; NAS 1.60:2713) Avail: NTIS HC
A11/MF A01 CSCL 01A
CAMBER, DELTA WINGS, PRESSURE MEASUREMENT,
SUBSONIC SPEED, THICKNESS, TWISTED WINGS

N87-29432*# National Aeronautics and Space Administration.
Ames Research Center, Moffett Field, Calif.
**AUTOMATED REDUCTION OF DATA FROM IMAGES AND
HOLOGRAMS**
G. LEE, ed., JAMES D. TROLINGER, ed. (Spectron Development
Labs., Inc., Costa Mesa, Calif.), and Y. H. YU, ed. May 1987
614 p Workshop held at Moffett Field, Calif., 10-11 Jan. 1985
(NASA-CP-2477; A-87135; NAS 1.55:2477) Avail: NTIS HC
A99/MF A01 CSCL 01A

COMBUSTIBLE FLOW, DIGITAL TECHNIQUES, HOLOGRAPHIC
INTERFEROMETRY, IMAGE ANALYSIS, PARTICLE SIZE
DISTRIBUTION

N87-29462*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A
TWIN-ENGINE GENERAL AVIATION CONFIGURATION WITH
AFT-FUSELAGE-MOUNTED PUSHER PROPELLERS**
DANA MORRIS DUNHAM, GARL L. GENTRY, JR., GREGORY S.
MANUEL, ZACHARY T. APPLIN, and P. FRANK QUINTO Oct.
1987 116 p
(NASA-TP-2763; L-16331; NAS 1.60:2763) Avail: NTIS HC
A06/MF A01 CSCL 01A

AERODYNAMIC CHARACTERISTICS, GENERAL AVIATION
AIRCRAFT, LOW SPEED, PROPELLERS, PROPULSION SYSTEM
CONFIGURATIONS, PYLON MOUNTING, TURBOPROP
ENGINES

03

AIR TRANSPORTATION AND SAFETY

Includes passenger and cargo air transport operations; and aircraft
accidents.

N87-10054*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
DOPPLER RADAR DETECTION OF WIND SHEAR
V. E. DELNORE, Comp. (PRC Kentron, Inc., Hampton, Va.) and
V. A. MCCLELLAN (Research Triangle Inst., Research Triangle
Park, N.C.) Sep. 1985 118 p Presented at a Meeting, Hampton,
Va., 24-25 Sep., 1985; sponsored in part by FAA
(NASA-CP-2435; NAS 1.55:2435; FAA/PM-86/31) Avail: NTIS
HC A06/MF A01 CSCL 01C
AIRCRAFT HAZARDS, CONFERENCES, DOPPLER RADAR,
MICROBURSTS, RADAR MEASUREMENT, WIND SHEAR

N87-22634*# National Aeronautics and Space Administration.
Ames Research Center, Moffett Field, Calif.
COCKPIT RESOURCE MANAGEMENT TRAINING
HARRY W. ORLADY, ed. (Orlady Associates, Inc., Los Gatos,
Calif.) and H. CLAYTON FOUSHÉE, ed. May 1987 308 p
Workshop held in San Francisco, Calif., 6-8 May 1986; sponsored
by NASA. Ames Research Center and Air Force Military Airlift
(NASA-CP-2455; A-87038; NAS 1.55:2455) Avail: NTIS HC
A14/MF A01 CSCL 01C
FLIGHT CREWS, FLIGHT SIMULATION, FLIGHT TRAINING,
GROUP DYNAMICS, PERSONNEL MANAGEMENT

N87-29469*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**JET TRANSPORT FLIGHT OPERATIONS USING COCKPIT
DISPLAY OF TRAFFIC INFORMATION DURING INSTRUMENT
METEOROLOGICAL CONDITIONS: SIMULATION EVALUATION**
DAVID H. WILLIAMS and DOUGLAS C. WELLS May 1986
50 p
(NASA-TP-2567; L-16091; NAS 1.60:2567) Avail: NTIS HC
A03/MF A01 CSCL 01C
AIR TRAFFIC CONTROL, COCKPIT SIMULATORS, DISPLAY
DEVICES, INSTRUMENT APPROACH, JET AIRCRAFT, TRANS-
PORT AIRCRAFT, VIDEO COMMUNICATION, WORKLOADS
(PSYCHOPHYSIOLOGY)

05

AIRCRAFT DESIGN, TESTING AND
PERFORMANCE

Includes aircraft simulation technology.

N87-11717*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**RECENT EXPERIENCES IN MULTIDISCIPLINARY ANALYSIS
AND OPTIMIZATION, PART 1**
J. SOBIESKI, comp. 1984 517 p Symposium held in Hampton,
Va., 24-26 Apr. 1984
(NASA-CP-2327-PT-1; NAS 1.55:2327-PT-1) Avail: NTIS HC
A22/MF A01 CSCL 01C
AIRCRAFT DESIGN, COMPUTER AIDED DESIGN, CONFER-
ENCES, DESIGN ANALYSIS, OPTIMIZATION, STRUCTURAL DE-
SIGN

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

N87-11750*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

RECENT EXPERIENCES IN MULTIDISCIPLINARY ANALYSIS AND OPTIMIZATION, PART 2

J. SOBIESKI, comp. 1984 509 p Symposium held in Hampton, Va., 24-26 Apr. 1984
(NASA-CP-2327-PT-2; L-15830; NAS 1.55:2327-PT-2) Avail: NTIS HC A22/MF A01 CSCL 01C
AIRCRAFT DESIGN, COMPUTER AIDED DESIGN, HELICOPTERS, OPTIMIZATION

N87-15959*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

LARGE-SCALE STATIC INVESTIGATION OF CIRCULATION-CONTROL-WING CONCEPTS APPLIED TO UPPER SURFACE-BLOWING AIRCRAFT

M. D. SHOVLIN, R. J. ENGLAR (Naval Ship Research and Development Center, Bethesda, Md.), J. C. EPPEL, and J. H. NICHOLS, JR. Jan. 1987 65 p
(NASA-TP-2684; NAS 1.60:2684) Avail: NTIS HC A04/MF A01 CSCL 01C

CIRCULATION CONTROL AIRFOILS, GROUND TESTS, LIFT AUGMENTATION, SHORT TAKEOFF AIRCRAFT, STATIC TESTS, THRUST CONTROL, TURBOFAN ENGINES, UPPER SURFACE BLOWING

N87-16815*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FLIGHT INVESTIGATION OF THE EFFECT OF TAIL CONFIGURATION ON STALL, SPIN, AND RECOVERY CHARACTERISTICS OF A LOW-WING GENERAL AVIATION RESEARCH AIRPLANE

H. PAUL STOUGH, III, JAMES M. PATTON, JR., and STEVEN M. SLIWA Feb. 1987 125 p
(NASA-TP-2644; L-16194; NAS 1.60:2644) Avail: NTIS HC A06/MF A01 CSCL 01C

AERODYNAMIC CONFIGURATIONS, AERODYNAMIC STALLING, AIRCRAFT SPIN, GENERAL AVIATION AIRCRAFT, RESEARCH AIRCRAFT, TAIL ASSEMBLIES

N87-17690*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EXPLOITING SYMMETRIES IN THE MODELING AND ANALYSIS OF TIRES

AHMED K. NOOR (Joint Inst. for Advancement of Flight Sciences, Hampton, Va.), CARL M. ANDERSEN (College of William and Mary, Hampton, Va.), and JOHN A. TANNER Mar. 1987 63 p
(NCC1-40)
(NASA-TP-2649; L-16185; NAS 1.60:2649) Avail: NTIS HC A04/MF A01 CSCL 01C

FINITE ELEMENT METHOD, MATHEMATICAL MODELS, SYMMETRY, TIRES

N87-17693*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECTS OF EMPENNAGE SURFACE LOCATION ON AERODYNAMIC CHARACTERISTICS OF A TWIN-ENGINE AFTERBODY MODEL WITH NONAXISYMMETRIC NOZZLES

FRANCIS J. CAPONE and GEORGE T. CARSON, JR. Feb. 1985 79 p
(NASA-TP-2392; L-15825; NAS 1.60:2392) Avail: NTIS HC A05/MF A01 CSCL 01C

AERODYNAMIC CHARACTERISTICS, AERODYNAMIC DRAG, AFTERBODIES, AXISYMMETRIC BODIES, FIGHTER AIRCRAFT, NOZZLE GEOMETRY, TAIL ASSEMBLIES, TAIL SURFACES

N87-20990*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SUMMARY OF STUDIES TO REDUCE WING-MOUNTED PROPFAN INSTALLATION DRAG ON AN M = 0.8 TRANSPORT

RONALD C. SMITH, ALAN D. LEVIN, and RICHARD D. WOOD May 1987 29 p
(NASA-TP-2678; A-86242; NAS 1.60:2678) Avail: NTIS HC A03/MF A01 CSCL 01C

DRAG REDUCTION, HIGH SPEED, PROP-FAN TECHNOLOGY, TRANSPORT AIRCRAFT, WIND TUNNEL TESTS

N87-23614*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FLIGHT INVESTIGATION OF THE EFFECTS OF AN OUTBOARD WING-LEADING-EDGE MODIFICATION ON STALL/SPIN CHARACTERISTICS OF A LOW-WING, SINGLE-ENGINE, T-TAIL LIGHT AIRPLANE

H. PAUL STOUGH, III, DANIEL J. DICARLO, and JAMES M. PATTON, JR. Jul. 1987 117 p
(NASA-TP-2691; L-16243; NAS 1.60:2691) Avail: NTIS HC A06/MF A01 CSCL 01A

AERODYNAMIC STALLING, FLIGHT TESTS, INVESTIGATION, LEADING EDGES, REVISIONS, SPIN, WINGS

N87-24458*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MEASUREMENTS OF FLOW RATE AND TRAJECTORY OF AIRCRAFT TIRE-GENERATED WATER SPRAY

ROBERT H. DAUGHERTY and SANDY M. STUBBS Jul. 1987 118 p
(NASA-TP-2718; L-16195; NAS 1.60:2718) Avail: NTIS HC A06/MF A01 CSCL 01C

AIRCRAFT TIRES, ENGINE INLETS, FLOW VELOCITY, INGESTION (ENGINES), SPLASHING, SPRAYING

N87-26041*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EVALUATION OF INSTALLED PERFORMANCE OF A WING-TIP-MOUNTED PUSHER TURBOPROP ON A SEMISPAN WING

JAMES C. PATTERSON, JR. and GLYNN R. BARTLETT Aug. 1987 30 p
(NASA-TP-2739; L-16252; NAS 1.60:2739) Avail: NTIS HC A03/MF A01 CSCL 01C

INSTALLING, PROPELLERS, SEMISPAN MODELS, TURBOFAN ENGINES, TURBOPROP ENGINES, WING TIP VORTICES

N87-29497*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

QUALITATIVE EVALUATION OF A FLUSH AIR DATA SYSTEM AT TRANSONIC SPEEDS AND HIGH ANGLES OF ATTACK

TERRY J. LARSON, STEPHEN A. WHITMORE, L. J. EHERNBERGER, J. BLAIR JOHNSON, and PAUL M. SIEMERS, III Washington NASA Apr. 1987 64 p
(NASA-TP-2716; H-1277; NAS 1.60:2716) Avail: NTIS HC A04/MF A01 CSCL 01C

AIR DATA SYSTEMS, ANGLE OF ATTACK, FLOW DISTRIBUTION, ORIFICE FLOW, PITOT TUBES, STAGNATION PRESSURE, TRANSONIC SPEED

N87-29499*# National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

APPLICATION OF PARAMETER ESTIMATION TO AIRCRAFT STABILITY AND CONTROL: THE OUTPUT-ERROR APPROACH

RICHARD E. MAINE and KENNETH W. ILIFF Jun. 1986 175 p Submitted for publication
(NASA-RP-1168; H-1299; NAS 1.61:1168) Avail: NTIS HC A08/MF A01 CSCL 01C

The practical application of parameter estimation methodology to the problem of estimating aircraft stability and control derivatives from flight test data is examined. The primary purpose of the

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document is to present a comprehensive and unified picture of the entire parameter estimation process and its integration into a flight test program. The document concentrates on the output-error method to provide a focus for detailed examination and to allow us to give specific examples of situations that have arisen. The document first derives the aircraft equations of motion in a form suitable for application to estimation of stability and control derivatives. It then discusses the issues that arise in adapting the equations to the limitations of analysis programs, using a specific program for an example. The roles and issues relating to mass distribution data, preflight predictions, maneuver design, flight scheduling, instrumentation sensors, data acquisition systems, and data processing are then addressed. Finally, the document discusses evaluation and the use of the analysis results. Author

applications of signal conditioning for the most common flight-test data-acquisition systems. A limited amount of theoretical discussion is included to assist the reader in a more complete understanding of the subject matter. Nonspecific signal conditioning, such as amplification, filtering, and multiplexing, is discussed. Signal conditioning for various specific transducers and data terminal devices is also discussed to illustrate signal conditioning that is unique to particular types of transducers. The purpose is to delineate for the reader the various signal-conditioning technique options, together with tradeoff considerations, for commonly encountered flight-test situations.

Author

06

AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

N87-10864*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

GROUND-BASED TIME-GUIDANCE ALGORITHM FOR CONTROL OF AIRPLANES IN A TIME-METERED AIR TRAFFIC CONTROL ENVIRONMENT: A PILOTED SIMULATION STUDY

C. E. KNOX and N. IMBERT (Office National d'Etudes et de Recherches Aerospatiales, Toulouse, France) Nov. 1986 36 p (NASA-TP-2616; L-16116; NAS 1.60:2616) Avail: NTIS HC

A03/MF A01 CSCL 01D

AIR TRAFFIC CONTROL, ENERGY CONSERVATION, FLIGHT MANAGEMENT SYSTEMS, FLIGHT SIMULATION, FUEL CONSUMPTION, PILOTS (PERSONNEL), TIMING DEVICES

N87-13438*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DEVELOPMENT AND EVALUATION OF AN AIRPLANE ELECTRONIC DISPLAY FORMAT ALIGNED WITH THE INERTIAL VELOCITY VECTOR

G. G. STEINMETZ Dec. 1986 23 p (NASA-TP-2648; L-16168; NAS 1.60:2648) Avail: NTIS HC

A02/MF A01 CSCL 01D

ALIGNMENT, DIRECTIONAL CONTROL, DISPLAY DEVICES, ELECTRONIC EQUIPMENT, FLIGHT TESTS, INERTIAL NAVIGATION, PERFORMANCE TESTS, VELOCITY

N87-19393*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

A SIMULATION EVALUATION OF A PILOT INTERFACE WITH AN AUTOMATIC TERMINAL APPROACH SYSTEM

DAVID A. HINTON Apr. 1987 21 p (NASA-TP-2669; L-16222; NAS 1.60:2669) Avail: NTIS HC

A02/MF A01 CSCL 17G

APPROACH CONTROL, AUTOMATIC CONTROL, AUTOMATIC PILOTS, GENERAL AVIATION AIRCRAFT, MAN MACHINE SYSTEMS

N87-29533*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ANALOG SIGNAL CONDITIONING FOR FLIGHT-TEST INSTRUMENTATION

DONALD W. VEATCH and RODNEY K. BOGUE Washington NASA Jan. 1986 173 p Presented at the AGARD Flight Mechanics Panel, Flight-test Techniques Working Group, AGARDograph 160, Flight-Test Instrumentation Series Previously announced as N86-29816 (NASA-RP-1159; H-1191; NAS 1.61:1159) Avail: NTIS HC

A08/MF A01 CSCL 01D

The application of analog signal conditioning to flight-tests data acquisition systems is discussed. Emphasis is placed on practical

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AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and onboard auxiliary power plants for aircraft.

N87-17699*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DESIGN OF 9.271-PRESSURE-RATIO 5-STAGE CORE COMPRESSOR AND OVERALL PERFORMANCE FOR FIRST 3 STAGES

RONALD J. STEINKE May 1986 35 p (NASA-TP-2597; E-2589; NAS 1.60:2597) Avail: NTIS HC

A03/MF A01 CSCL 21E

COMPRESSORS, DESIGN ANALYSIS, FLOW DISTRIBUTION, PERFORMANCE TESTS, ROTOR BLADES (TURBOMACHINERY)

N87-20267*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

NASA-CHINESE AERONAUTICAL ESTABLISHMENT (CAE) SYMPOSIUM

1986 230 p Symposium held in Cleveland, Ohio, 23-27 Sep. 1985

(NASA-CP-2433; E-3033; NAS 1.55:2433) Avail: NTIS HC

A01/MF A01 CSCL 21E

COMBUSTION, FLUID DYNAMICS, THERMODYNAMICS

N87-24481*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

LOW-COST FM OSCILLATOR FOR CAPACITANCE TYPE OF BLADE TIP CLEARANCE MEASUREMENT SYSTEM

JOHN P. BARRANGER Jul. 1987 16 p (NASA-TP-2746; E-3455; NAS 1.60:2746) Avail: NTIS HC

A02/MF A01 CSCL 21E

BLADE TIPS, ERROR ANALYSIS, FREQUENCY MODULATION, NONDESTRUCTIVE TESTS, OSCILLATORS, ROTOR BLADES (TURBOMACHINERY)

08

AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N87-10103*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

IN-FLIGHT TOTAL FORCES, MOMENTS AND STATIC AEROELASTIC CHARACTERISTICS OF AN OBLIQUE-WING RESEARCH AIRPLANE

R. E. CURRY and A. G. SIM Oct. 1984 30 p
(NASA-TP-2224; H-1181; NAS 1.60:2224) Avail: NTIS HC
A03/MF A01 CSCL 01C

AEROELASTIC RESEARCH WINGS, AIRCRAFT DESIGN, FLIGHT TESTS, OBLIQUE WINGS, RESEARCH AIRCRAFT, STRUCTURAL DESIGN, WIND TUNNEL TESTS

N87-10870*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

INTERFERENCE EFFECTS OF THRUST REVERSING ON HORIZONTAL TAIL EFFECTIVENESS OF TWIN-ENGINE FIGHTER AIRCRAFT AT MACH NUMBERS FROM 0.15 TO 0.90

F. J. CAPONE and M. L. MASON Oct. 1984 104 p
(NASA-TP-2350; L-15811; NAS 1.60:2350) Avail: NTIS HC
A06/MF A01 CSCL 01C

AERODYNAMIC INTERFERENCE, FIGHTER AIRCRAFT, TAIL ASSEMBLIES, THRUST REVERSAL, WIND TUNNEL TESTS

N87-10871*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FLIGHT-DETERMINED AERODYNAMIC DERIVATIVES OF THE AD-1 OBLIQUE-WING RESEARCH AIRPLANE

A. G. SIM and R. E. CURRY Oct. 1984 40 p
(NASA-TP-2222; H-1179; NAS 1.60:2222) Avail: NTIS HC
A03/MF A01 CSCL 01C

AERODYNAMIC COEFFICIENTS, OBLIQUE WINGS, RESEARCH AIRCRAFT, VARIABLE SWEEP WINGS

N87-16849*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PILOTED SIMULATOR STUDY OF ALLOWABLE TIME DELAYS IN LARGE-AIRPLANE RESPONSE

WILLIAM D. GRANTHAM, PAUL M. SMITH (PRC Kentron, Inc., Hampton, Va.), LEE H. PERSON, JR., ROBERT T. MEYER (Lockheed-Georgia Co., Marietta), and STEPHEN A. TINGAS Feb. 1987 69 p

(NASA-TP-2652; L-16149; NAS 1.60:2652) Avail: NTIS HC
A04/MF A01 CSCL 01C

CONTROL SYSTEMS DESIGN, FLIGHT CHARACTERISTICS, FLIGHT SIMULATORS, LOW SPEED, TIME LAG, TRANSPORT AIRCRAFT

N87-18570*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FLIGHT CHARACTERISTICS OF THE AD-1 OBLIQUE-WING RESEARCH AIRCRAFT

ALEX G. SIM and ROBERT E. CURRY Mar. 1985 29 p
(NASA-TP-2223; H-1180; NAS 1.60:2223) Avail: NTIS HC
A03/MF A01 CSCL 01C

AERODYNAMIC CONFIGURATIONS, FLIGHT CHARACTERISTICS, LOW SPEED, OBLIQUE WINGS, RESEARCH AIRCRAFT

N87-25331*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ADVANCED DETECTION, ISOLATION AND ACCOMMODATION OF SENSOR FAILURES: REAL-TIME EVALUATION

WALTER C. MERRILL, JOHN C. DELAAT, and WILLIAM M. BRUTON Jul. 1987 30 p
(NASA-TP-2740; E-3479; NAS 1.60:2740) Avail: US Patent and Trademark Office CSCL 01C

ENGINE CONTROL, ENGINE FAILURE, FAULT TOLERANCE, REDUNDANCY ENCODING, REMOTE SENSORS, TURBINE ENGINES

N87-26922*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PILOTED-SIMULATION STUDY OF EFFECTS OF VORTEX FLAPS ON LOW-SPEED HANDLING QUALITIES OF A DELTA-WING AIRPLANE

JAY M. BRANDON, PHILIP W. BROWN, and ALFRED J. WUNSCHEL Sep. 1987 38 p
(NASA-TP-2747; L-16307; NAS 1.60:2747) Avail: NTIS HC
A03/MF A01 CSCL 01C

CONTROLLABILITY, DELTA WINGS, FLIGHT SIMULATION, LOW SPEED, PILOTS (PERSONNEL), VORTEX FLAPS

09

RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tubes; and aircraft engine test stands.

N87-10876*# National Aeronautics and Space Administration. Washington, D.C.

AERONAUTICAL FACILITIES ASSESSMENT

F. E. PENARANDA, comp. Nov. 1985 204 p
(NASA-RP-1146; NAS 1.61:1146) Avail: NTIS HC A10/MF A01 CSCL 14B

A survey of the free world's aeronautical facilities was undertaken and an evaluation made on where the relative strengths and weaknesses exist. Special emphasis is given to NASA's own capabilities and needs. The types of facilities surveyed are: Wind Tunnels; Airbreathing Propulsion Facilities; and Flight Simulators

Author

N87-17717*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EXPERIMENTAL EVALUATION OF WALL MACH NUMBER DISTRIBUTIONS OF THE OCTAGONAL TEST SECTION PROPOSED FOR NASA LEWIS RESEARCH CENTER'S ALTITUDE WIND TUNNEL

DOUGLAS E. HARRINGTON, RICHARD R. BURLEY, and ROBERT R. CORBAN Nov. 1986 35 p
(NASA-TP-2666; E-3145; NAS 1.60:2666) Avail: NTIS HC
A03/MF A01 CSCL 14B

FLOW VELOCITY, MACH NUMBER, WIND TUNNEL APPARATUS, WIND TUNNEL WALLS

N87-18576*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EXPERIMENTAL EVALUATION OF TWO TURNING VANE DESIGNS FOR FAN DRIVE CORNER OF 0.1-SCALE MODEL OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL

DONALD R. BOLDMAN, ROYCE D. MOORE, and RICKY J. SHYNE Mar. 1987 148 p
(NASA-TP-2646; E-3175; NAS 1.60:2646) Avail: NTIS HC
A07/MF A01 CSCL 14B

CORNER FLOW, VANES, WIND TUNNEL APPARATUS, WIND TUNNEL DRIVES

15 LAUNCH VEHICLES AND SPACE VEHICLES

N87-20295*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

DETAILED FLOW SURVEYS OF TURNING VANES DESIGNED FOR A 0.1-SCALE MODEL OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL

ROYCE D. MOORE, RICKY J. SHYNE, DONALD R. BOLDMAN, and THOMAS F. GELDER Apr. 1987 151 p
(NASA-TP-2680; E-3294; NAS 1.60:2680) Avail: NTIS HC
A08/MF A01 CSCL 14B

ALTITUDE SIMULATION, FLOW DISTRIBUTION, GUIDE VANES, WIND TUNNEL APPARATUS, WIND TUNNEL DRIVES

N87-22694*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

EXPERIMENTAL EVALUATION OF BLOCKAGE RATIO AND PLENUM EVACUATION SYSTEM FLOW EFFECTS ON PRESSURE DISTRIBUTION FOR BODIES OF REVOLUTION IN 0.1 SCALE MODEL TEST SECTION OF NASA LEWIS RESEARCH CENTER'S PROPOSED ALTITUDE WIND TUNNEL

RICHARD R. BURLEY and DOUGLAS E. HARRINGTON Apr. 1987 26 p
(NASA-TP-2702; E-3267; NAS 1.60:2702) Avail: NTIS HC
A03/MF A01 CSCL 14B

EVACUATING (VACUUM), EVALUATION, PLENUM CHAMBERS, WIND TUNNEL MODELS, WIND TUNNEL TESTS

N87-23662*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

EXPERIMENTAL EVALUATION OF HONEYCOMB/SCREEN CONFIGURATIONS AND SHORT CONTRACTION SECTION FOR NASA LEWIS RESEARCH CENTER'S ALTITUDE WIND TUNNEL

RICHARD R. BURLEY and DOUGLAS E. HARRINGTON May 1987 30 p
(NASA-TP-2692; E-3142; NAS 1.60:2692) Avail: NTIS HC
A03/MF A01 CSCL 14B

HONEYCOMB STRUCTURES, PRESSURE DISTRIBUTION, SCREENS, TURBULENCE EFFECTS, TURBULENT FLOW, WIND TUNNEL CALIBRATION

N87-28570*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

EVOLUTION, CALIBRATION, AND OPERATIONAL CHARACTERISTICS OF THE TWO-DIMENSIONAL TEST SECTION OF THE LANGLEY 0.3-METER TRANSONIC CRYOGENIC TUNNEL

CHARLES L. LADSON and EDWARD J. RAY Sep. 1987 171 p
(NASA-TP-2749; L-16190; NAS 1.60:2749) Avail: NTIS HC
A08/MF A01 CSCL 14B

CRYOGENIC WIND TUNNELS, EVOLUTION (DEVELOPMENT), HISTORIES, TRANSONIC WIND TUNNELS, TWO DIMENSIONAL FLOW

N87-29544*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

LANGLEY AIRCRAFT LANDING DYNAMICS FACILITY

PAMELA A. DAVIS, SANDY M. STUBBS, and JOHN A. TANNER Oct. 1987 35 p
(NASA-RP-1189; L-16293; NAS 1.61:1189) Avail: NTIS HC
A03/MF A01 CSCL 14B

The Langley Research Center has recently upgraded the Landing Loads Track (LLT) to improve the capability of low-cost testing of conventional and advanced landing gear systems. The unique feature of the Langley Aircraft Landing Dynamics Facility (ALDF) is the ability to test aircraft landing gear systems on actual runway surfaces at operational ground speeds and loading conditions. A historical overview of the original LLT is given, followed by a detailed description of the new ALDF systems and operational capabilities. Author

12

ASTRONAUTICS (GENERAL)

N87-20302*# National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.

THE 1986 GET AWAY SPECIAL EXPERIMENTER'S SYMPOSIUM

LAWRENCE R. THOMAS, ed. and FRANCES L. MOSIER, ed. Feb. 1987 236 p Symposium held in Greenbelt, Md., 7-8 Oct. 1986
(NASA-CP-2438; NAS 1.55:2438) Avail: NTIS HC A11/MF A01 CSCL 22A

CONFERENCES, GETAWAY SPECIALS (STS), GOVERNMENT/INDUSTRY RELATIONS, SPACE SHUTTLE PAYLOADS, UNIVERSITIES

N87-29576*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

TECHNOLOGY FOR LARGE SPACE SYSTEMS. A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 17)

Oct. 1987 140 p
(NASA-SP-7046(17); NAS 1.21:7046(17)) Avail: NTIS HC A07 CSCL 22B

This bibliography lists 512 reports, articles, and other documents introduced into the NASA scientific and technical information system between January 1, 1987 and June 30, 1987. Its purpose is to provide helpful information to the researcher, manager, and designer in technology development and mission design according to system, interactive analysis and design, structural and thermal analysis and design, structural concepts and control systems, electronics, advanced materials, assembly concepts, propulsion, and solar power satellite systems. Author

15

LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; operating problems of launch/space vehicle systems; and reusable vehicles.

N87-12581*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

SOLAR ARRAY FLIGHT DYNAMIC EXPERIMENT

R. W. SCHOCK Washington May 1986 27 p
(NASA-TP-2598; NAS 1.60:2598) Avail: NTIS HC A03/MF A01 CSCL 10A

LARGE SPACE STRUCTURES, LASER APPLICATIONS, SOLAR ARRAYS, SPACE SHUTTLE PAYLOADS, TRACKING (POSITION)

N87-18588*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

SYSTEM STUDY OF THE CARBON DIOXIDE OBSERVATIONAL PLATFORM SYSTEM (CO-OPS): PROJECT OVERVIEW

J. BRISCOE STEPHENS and WILBUR E. THOMPSON Mar. 1987 35 p
(NASA-TP-2696; NAS 1.60:2696) Avail: NTIS HC A03/MF A01 CSCL 22B

ATMOSPHERIC COMPOSITION, CARBON DIOXIDE, REMOTE SENSING, SPACE PLATFORMS

15 LAUNCH VEHICLES AND SPACE VEHICLES

N87-22702*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES

ROBERT S. RYAN, ed. and HAROLD N. SCOFIELD, ed. Apr. 1987 680 p Workshop held in Huntsville, ALA., 22-24 Apr. 1986

(NASA-CP-2467-PT-1; M-554-PT-1; NAS 1.55:2467-PT-1) Avail: NTIS HC A99/MF E03 CSCL 22B

CONTROL SYSTEMS DESIGN, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, LARGE SPACE STRUCTURES, SPACECRAFT CONTROL

N87-22729*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

STRUCTURAL DYNAMICS AND CONTROL INTERACTION OF FLEXIBLE STRUCTURES

ROBERT S. RYAN, ed. and HAROLD N. SCOFIELD, ed. Apr. 1987 729 p Workshop held in Huntsville, Ala., 22-24 Apr. 1986

(NASA-CP-2467-PT-2; M-554-PT-2; NAS 1.55:2467-PT-2) Avail: NTIS HC A99/MF E03 CSCL 22B

CONFERENCES, DESIGN ANALYSIS, DYNAMIC STRUCTURAL ANALYSIS, FLEXIBLE BODIES, JOINTS (JUNCTIONS), LARGE SPACE STRUCTURES, ORBITAL SPACE STATIONS

CONTROL, SPACECRAFT DESIGN, SYSTEMS ENGINEERING, TRUSSES, VIBRATION DAMPING

N87-24495*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

NASA/DOD CONTROL/STRUCTURES INTERACTION TECHNOLOGY, 1986

ROBERT L. WRIGHT, comp. Jun. 1987 314 p Conference held in Norfolk, Va., 18-21 Nov. 1986

(NASA-CP-2447-PT-2; L-16242-PT-2; NAS 1.55:2447-PT-2)

Avail: NTIS HC A14/MF A01 CSCL 22B

CONTROL STABILITY, CONTROL SYSTEMS DESIGN, INTERACTIVE CONTROL, ORBITAL SPACE STATIONS, SPACECRAFT CONTROL, VIBRATION DAMPING

N87-26073* National Aeronautics and Space Administration, Washington, D.C.

SPACE STATION SYSTEMS: A BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 4)

May 1987 220 p

(NASA-SP-7056(04); NAS 1.21:7056(04)) Avail: NTIS HC A10 CSCL 22B

This bibliography lists 832 reports, articles, and other documents introduced into the NASA scientific and technical information system between July 1, 1986 and December 31, 1986. Its purpose is to provide helpful information to the researcher, manager, and designer in technology development and mission design according to system, interactive analysis and design, structural and thermal analysis and design, structural concepts and control systems, electronics, advanced materials, assembly concepts, propulsion, and solar power satellite systems. The coverage includes documents that define major systems and subsystems, servicing and support requirements, procedures and operations, and missions for the current and future space station.

Author

16

SPACE TRANSPORTATION

Includes passenger and cargo space transportation, e.g., shuttle operations; and space rescue techniques.

N87-12585*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DEVELOPMENT TESTING OF LARGE VOLUME WATER SPRAYS FOR WARM FOG DISPERSAL

V. W. KELLER, B. J. ANDERSON, R. A. BURNS, G. G. LALA (New York State Univ., Albany), M. B. MEYER, and K. V. BEARD (Illinois Univ., Urbana-Champaign) Washington Jun. 1986 112 p

(NASA-TP-2607; NAS 1.60:2607) Avail: NTIS HC A06/MF A01 CSCL 14B

COALESCING, FOG DISPERSAL, SPACE SHUTTLES, SPACECRAFT LAUNCHING, SPRAY NOZZLES, WATER

18

SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes satellites; space platforms; space stations; spacecraft systems and components such as thermal and environmental controls; and attitude controls.

N87-16014*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

NASA/DOD CONTROL/STRUCTURES INTERACTION TECHNOLOGY, 1986

ROBERT L. WRIGHT, comp. Nov. 1986 549 p Conference held in Norfolk, Va., 18-21 Nov. 1986; sponsored by NASA Langley Research Center and AFVAL

(NASA-CP-2447-PT-1; L-16242-PT-1; NAS 1.55:2447-PT-1)

Avail: NTIS HC A23/MF A01 CSCL 22B

ANTENNAS, CONFERENCES, FLEXIBLE SPACECRAFT, LARGE SPACE STRUCTURES, SPACE STATIONS, SPACECRAFT

20

SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components, e.g., rocket engines; and spacecraft auxiliary power sources.

N87-20380*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SOLAR ARRAY FLIGHT EXPERIMENT/DYNAMIC AUGMENTATION EXPERIMENT

LEIGHTON E. YOUNG and HOMER C. PACK, JR. Feb. 1987 72 p

(NASA-TP-2690; NAS 1.60:2690) Avail: NTIS HC A04/MF A01 CSCL 10A

LARGE SPACE STRUCTURES, SOLAR ARRAYS, SOLAR DYNAMIC POWER SYSTEMS, SPACE ERECTABLE STRUCTURES, SPACE SHUTTLE PAYLOADS

N87-20381*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EXPERIMENTAL THRUST PERFORMANCE OF A HIGH-AREA-RATIO ROCKET NOZZLE

ALBERT J. PAVLI, KENNETH J. KACYNISKI, and TAMARA A. SMITH Apr. 1987 16 p Presented at the 23rd JANNAF Combustion Meeting, Hampton, Va., 20-24 Oct. 1986

(NASA-TP-2720; E-3236-1; NAS 1.60:2720) Avail: NTIS HC

A02/MF A01 CSCL 21H

AREA, NOZZLE GEOMETRY, ROCKET NOZZLES, ROCKET THRUST

N87-22766*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**STRUCTURAL INTEGRITY AND DURABILITY OF REUSABLE
SPACE PROPULSION SYSTEMS**

1987 205 p Conference held in Cleveland, Ohio, 12-13 May
1987

(NASA-CP-2471; E-3512; NAS 1.55:2471) Avail: NTIS HC

A10/MF A01 CSCL 21H

AEROTHERMODYNAMICS, CONFERENCES, DURABILITY,
DYNAMIC STRUCTURAL ANALYSIS, FATIGUE (MATERIALS),
FRACTURE MECHANICS, SPACE SHUTTLE MAIN ENGINE,
SPACECRAFT PROPULSION, STRUCTURAL RELIABILITY

N87-25423*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**COMPARISON OF THEORETICAL AND EXPERIMENTAL
THRUST PERFORMANCE OF A 1030:1 AREA RATIO ROCKET
NOZZLE AT A CHAMBER PRESSURE OF 2413 KN/M2 (350
PSIA)**

TAMARA A. SMITH, ALBERT J. PAVLI, and KENNETH J.
KACYNISKI 1987 25 p Presented at the 23rd Joint Propulsion
Conference, San Diego, Calif., 29 Jun. - 2 Jul. 1987; sponsored
by AIAA, SAE, ASME and ASEE

(NASA-TP-2725; E-3523; NAS 1.60:2725; AIAA-87-2069) Avail:

NTIS HC A02/MF A01 CSCL 21H

ENGINE TESTS, PREDICTIONS, ROCKET NOZZLES, ROCKET
THRUST

N87-25424*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**EXPERIMENTAL EVALUATION OF HEAT TRANSFER ON A
1030:1 AREA RATIO ROCKET NOZZLE**

KENNETH J. KACYNISKI, ALBERT J. PAVLI, and TAMARA A.
SMITH Aug. 1987 28 p Presented at the 23rd Joint Propulsion
Conference, San Diego, Calif., 29 Jun. - 2 Jul. 1987; sponsored
by AIAA, SAE, ASME and ASEE

(NASA-TP-2726; E-3558; NAS 1.60:2726; AIAA-87-2070) Avail:

NTIS HC A03/MF A01 CSCL 21H

EXHAUST NOZZLES, HEAT FLUX, HEAT TRANSFER,
NOZZLE FLOW, ROCKET NOZZLES, WALL TEMPERATURE

N87-25425*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**ANALYSIS OF QUASI-HYBRID SOLID ROCKET BOOSTER
CONCEPTS FOR ADVANCED EARTH-TO-ORBIT VEHICLES**

ROBERT L. ZURAWSKI and DOUGLAS C. RAPP (Sverdrup
Technology, Inc., Cleveland, Ohio.) Aug. 1987 32 p Presented
at the 23rd Joint Propulsion Conference, San Diego, Calif. 29
Jun. - 2 Jul. 1987; sponsored by AIAA, SAE, ASME and ASEE
(NASA-TP-2751; E-3554; NAS 1.60:2751; AIAA-87-2082) Avail:
NTIS HC A03/MF A01 CSCL 21H

FEASIBILITY ANALYSIS, HYBRID PROPELLANT ROCKET
ENGINES, SPACE SHUTTLE BOOSTERS

23

CHEMISTRY AND MATERIALS (GENERAL)

N87-18611*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**SPECTROSCOPIC COMPARISON OF EFFECTS OF ELECTRON
RADIATION ON MECHANICAL PROPERTIES OF TWO
POLYIMIDES**

EDWARD R. LONG, JR. and SHEILA ANN T. LONG Apr. 1987
21 p

(NASA-TP-2663; L-16200; NAS 1.60:2663) Avail: NTIS HC
A02/MF A01 CSCL 11C

DURABILITY, ELECTRON RADIATION, KAPTON (TRADE-
MARK), RADIATION DAMAGE, TENSILE PROPERTIES

24

COMPOSITE MATERIALS

Includes physical, chemical, and mechanical properties of laminates
and other composite materials.

N87-10184*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**EFFECTS OF THERMAL CYCLING ON GRAPHIE-FIBER-REIN-
FORCED 6061 ALUMINUM**

G. A. DRIES (PRC Kentron, Inc., Hampton, Va.) and S. S.
TOMPKINS Oct. 1986 29 p

(NASA-TP-2612; L-16139; NAS 1.60:2612) Avail: NTIS HC
A03/MF A01 CSCL 11D

ALUMINUM GRAPHITE COMPOSITES, CARBON FIBERS,
METAL MATRIX COMPOSITES, REINFORCING FIBERS,
SPACECRAFT STRUCTURES, THERMAL CYCLING TESTS

N87-25435*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**PRELIMINARY STRUCTURAL DESIGN OF COMPOSITE MAIN
ROTOR BLADES FOR MINIMUM WEIGHT**

MARK W. NIXON Jul. 1987 28 p Prepared in cooperation
with Army Aviation Research and Development Command,
Hampton, Va.

(DA PROJ. 1L1-62209-AH-76)

(NASA-TP-2730; L-16310; NAS 1.60:2730; AVSCOM-TM-87-B-6)

Avail: NTIS HC A03/MF A01 CSCL 11D

BLADES, COMPOSITE MATERIALS, DYNAMIC STRUCTURAL
ANALYSIS, HELICOPTERS, ROTORS, WEIGHT REDUCTION

N87-29612*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**THE ACEE PROGRAM AND BASIC COMPOSITES RESEARCH
AT LANGLEY RESEARCH CENTER (1975 TO 1986): SUMMARY
AND BIBLIOGRAPHY**

MARVIN B. DOW Oct. 1987 147 p

(NASA-RP-1177; L-16290; NAS 1.61:1177) Avail: NTIS HC

A07/MF A01 CSCL 11D

Composites research conducted at the Langley Research
Center during the period from 1975 to 1986 is described, and an
annotated bibliography of over 600 documents (with their abstracts)
is presented. The research includes Langley basic technology and
the composite primary structures element of the NASA Aircraft
Energy Efficiency (ACEE) Program. The basic technology
documents cited in the bibliography are grouped according to the
research activity such as design and analysis, fatigue and fracture,
and damage tolerance. The ACEE documents cover development
of composite structures for transport aircraft. Author

25 INORGANIC AND PHYSICAL CHEMISTRY

25

INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

N87-18629*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ELECTRON STIMULATED DESORPTION OF ATOMIC OXYGEN FROM SILVER

R. A. OUTLAW, W. K. PEREGOY, GAR B. HOFLUND (Florida Univ., Gainesville), and GREGORY R. CORALLO Apr. 1987 25 p
(NASA-TP-2668; L-16225; NAS 1.60:2668) Avail: NTIS HC A02/MF A01 CSCL 07D

ATOMIC BEAMS, DESORPTION, ELECTRON EMISSION, OXYGEN, SILVER, STIMULATED EMISSION

N87-21076*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

THE CORROSION MECHANISMS FOR PRIMER COATED 2219-T87 ALUMINUM

MERLIN D. DANFORD and WARD W. KNOCKEMUS (Huntingdon Coll., Montgomery, Ala.) Apr. 1987 25 p
(NASA-TP-2715; M-559; NAS 1.60:2715) Avail: NTIS HC A02/MF A01 CSCL 11F

ALUMINUM ALLOYS, CORROSION RESISTANCE, PRIMERS (COATINGS), PROTECTIVE COATINGS

N87-25463*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

HYDROGEN TRAPPING AND THE INTERACTION OF HYDROGEN WITH METALS

MERLIN D. DANFORD Jul. 1987 36 p
(NASA-TP-2744; NAS 1.60:2744) Avail: NTIS HC A03/MF A01 CSCL 11F

CRYSTAL LATTICES, GAS-METAL INTERACTIONS, HYDROGEN, TRAPPING

26

METALLIC MATERIALS

Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N87-16902*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CONVENTIONALLY CAST AND FORGED COPPER ALLOY FOR HIGH-HEAT-FLUX THRUST CHAMBERS

JOHN M. KAZAROFF and GEORGE A. REPAS Feb. 1987 12 p
(NASA-TP-2694; E-3304; NAS 1.60:2694) Avail: NTIS HC A02/MF A01 CSCL 11F

COMBUSTION CHAMBERS, COPPER ALLOYS, HEAT FLUX, HIGH TEMPERATURE, LININGS, SPACE SHUTTLE MAIN ENGINE

N87-18644*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

EFFECT OF LID (REGISTERED) PROCESSING ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF Ti-6Al-4V AND Ti-6Al-2Sn-4Zr-2Mo TITANIUM FOIL-GAUGE MATERIALS

LINDA B. BALCKBURN Apr. 1987 27 p
(NASA-TP-2677; L-16098; NAS 1.60:2677) Avail: NTIS HC A03/MF A01 CSCL 11F

BONDING, DIFFUSION, INTERFACES, LIQUIDS, MECHANICAL PROPERTIES, MICROSTRUCTURE, PROTECTIVE COATINGS, TITANIUM ALLOYS

N87-20407*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MATERIAL CHARACTERIZATION OF SUPERPLASTICALLY FORMED TITANIUM (Ti-6Al-2Sn-4Zr-2Mo) SHEET

WILLIAM A. OSSA (PRC Kentron, Inc., Hampton, Va.) and DICK M. ROYSTER 1987 38 p
(NASA-TP-2674; L-16115; NAS 1.60:2674) Avail: NTIS HC A03/MF A01 CSCL 11F

AEROSPACE INDUSTRY, SUPERPLASTICITY, TENSILE CREEP, TITANIUM ALLOYS

N87-27024*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PERMEATION OF OXYGEN THROUGH HIGH PURITY, LARGE GRAIN SILVER

R. A. OUTLAW, W. K. PEREGOY, and GAR B. HOFLUND (Florida Univ., Gainesville.) Sep. 1987 19 p
(NASA-TP-2755; L-16305; NAS 1.60:2755) Avail: NTIS HC A02/MF A01 CSCL 11F

GRAIN BOUNDARIES, OXYGEN, PERMEATING, PURITY, SILVER

27

NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N87-12680*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

INVESTIGATION OF THE EFFECTS OF COBALT IONS ON EPOXY PROPERTIES

J. J. SINGH and D. M. STOAKLEY Dec. 1986 16 p
(NASA-TP-2639; L-16196; NAS 1.60:2639) Avail: NTIS HC A02/MF A01 CSCL 11G

COBALT, EPOXY RESINS, INVESTIGATION, IONS, MECHANICAL PROPERTIES

N87-18666*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ESTER OXIDATION ON AN ALUMINUM SURFACE USING CHEMILUMINESCENCE

WILLIAM R. JONES, JR., MICHAEL A. MEADOR, and WILFREDO MORALES Jul. 1986 16 p
(NASA-TP-2611; E-2647; NAS 1.60:2611) Avail: NTIS HC A02/MF A01 CSCL 11B

ALUMINUM ALLOYS, CHEMILUMINESCENCE, ESTERS, METAL SURFACES, OXIDATION

N87-20423*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

**MICROGRAVITY CRYSTALLIZATION OF MACROMOLECULES:
AN INTERIM REPORT AND PROPOSAL FOR CONTINUED
RESEARCH**

BENJAMIN E. GOLDBERG Dec. 1986 26 p
(NASA-TP-2671; NAS 1.60:2671) Avail: NTIS HC A03/MF A01
CSCL 20B

MOLECULES, POLYMER CHEMISTRY, RECRYSTALLIZATION,
REDUCED GRAVITY

29

MATERIALS PROCESSING

Includes space-based development of products and processes for
commercial applications.

N87-21141*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

MICROGRAVITY FLUID MANAGEMENT SYMPOSIUM
Apr. 1987 225 p Symposium held in Cleveland, Ohio, 9-10
Sep. 1986

(NASA-CP-2465; E-3386; NAS 1.55:2465) Avail: NTIS HC
A10/MF A01 CSCL 22A

AEROSPACE ENVIRONMENTS, CONFERENCES, FLUID
MANAGEMENT, WEIGHTLESSNESS

31

ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display
engineering; cryogenics; and fire prevention.

N87-22870*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

MODELING DIGITAL CONTROL SYSTEMS WITH MA-PREFILTERED MEASUREMENTS

MICHAEL E. POLITES Jun. 1987 23 p
(NASA-TP-2732; NAS 1.60:2732) Avail: NTIS HC A02/MF A01
CSCL 13H

CONTROL SYSTEMS DESIGN, DIGITAL FILTERS, DIGITAL
SYSTEMS, STATE VECTORS, SYSTEMS ENGINEERING

N87-24585*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

**A NEW APPROACH TO STATE ESTIMATION IN
DETERMINISTIC DIGITAL CONTROL SYSTEMS**

MICHAEL E. POLITES Jul. 1987 16 p
(NASA-TP-2745; NAS 1.60:2745) Avail: NTIS HC A02/MF A01
CSCL 09B

CONTROL SYSTEMS DESIGN, DIGITAL SYSTEMS, STATE
ESTIMATION

N87-27067*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

**EXACT STATE RECONSTRUCTION IN DETERMINISTIC
DIGITAL CONTROL SYSTEMS**

MICHAEL E. POLITES Aug. 1987 19 p
(NASA-TP-2757; NAS 1.60:2757) Avail: NTIS HC A02/MF A01
CSCL 13H

DIGITAL COMMAND SYSTEMS, STATE ESTIMATION, STATE
VECTORS

32

COMMUNICATIONS AND RADAR

Includes radar; land and global communications; communications
theory; and optical communications.

N87-11916*# National Aeronautics and Space Administration.
Wallop Flight Center, Wallop Island, Va.

**PULSE CODE MODULATION (PCM) ENCODER HANDBOOK FOR
AYDIN VECTOR MMP-600 SERIES SYSTEM**

S. F. CURRIER and W. R. POWELL Washington, D.C. Aug.
1986 139 p
(NASA-RP-1171; NAS 1.61:1171) Avail: NTIS HC A07/MF A01
CSCL 17B

The hardware and software characteristics of a time division
multiplex system are described. The system is used to sample
analog and digital data. The data is merged with synchronization
information to produce a serial pulse coded modulation (PCM) bit
stream. Information presented herein is required by users to design
compatible interfaces and assure effective utilization of this encoder
system. GSFC/Wallop Flight Facility has flown approximately 50
of these systems through 1984 on sounding rockets with no inflight
failures. Aydin Vector manufactures all of the components for these
systems. Author

N87-12718*# National Aeronautics and Space Administration.
Wallop Flight Center, Wallop Island, Va.

**PULSE CODE MODULATION (PCM) DATA STORAGE AND
ANALYSIS USING A MICROCOMPUTER**

D. E. MASSEY Aug. 1986 8 p
(NASA-TP-2629; REPT-822.3; NAS 1.60:2629) Avail: NTIS HC
A02/MF A01 CSCL 17B

DATA PROCESSING, DATA REDUCTION, DATA STORAGE,
MICROCOMPUTERS, PULSE CODE MODULATION

N87-17971*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**BIT-ERROR-RATE TESTING OF HIGH-POWER 30-GHZ
TRAVELING WAVE TUBES FOR GROUND-TERMINAL
APPLICATIONS**

KURT A. SHALKHAUSER and GENE FUJIKAWA Oct. 1986
16 p
(NASA-TP-2635; E-2996; NAS 1.60:2635) Avail: NTIS HC
A02/MF A01 CSCL 17B

BIT ERROR RATE, PERFORMANCE TESTS, TRANSMISSION
EFFICIENCY, TRAVELING WAVE TUBES

N87-20448*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**UNIQUE BIT-ERROR-RATE MEASUREMENT SYSTEM FOR
SATELLITE COMMUNICATION SYSTEMS**

MARY JO WINDMILLER Mar. 1987 13 p
(NASA-TP-2699; E-3322; NAS 1.60:2699) Avail: NTIS HC
A02/MF A01 CSCL 17B

BIT ERROR RATE, COMMUNICATION NETWORKS,
SATELLITE COMMUNICATION, SYSTEMS ANALYSIS

N87-24590*# National Aeronautics and Space Administration.
Wallop Flight Center, Wallop Island, Va.

**A SYNCHRONOUS DATA ANALYZER FOR THE MINIMUM
DELAY DATA FORMAT (MDDF) AND LAUNCH TRAJECTORY
ACQUISITION SYSTEM (LTAS)**

ANDREW J. GREEN Jul. 1987 10 p
(NASA-TP-2743; REPT-822.1; NAS 1.60:2743) Avail: NTIS HC
A02/MF A01 CSCL 17B

DATA REDUCTION, LAUNCHING, SAMPLING, SYNCHRONISM,
TRAJECTORY ANALYSIS

33

ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

N87-11072*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

THE 1985 GODDARD SPACE FLIGHT CENTER BATTERY WORKSHOP

G. MORROW, ed. Sep. 1986 427 p Workshop held in Greenbelt, Md., 19-21 Nov. 1985
(NASA-CP-2434; REPT-86B0366; NAS 1.55:2434) Avail: NTIS HC A19/MF A01 CSCL 10C

CONFERENCES, ENERGY STORAGE, LITHIUM SULFUR BATTERIES, NICKEL CADMIUM BATTERIES, NICKEL HYDROGEN BATTERIES

N87-17990*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PERFORMANCE OF TEXTURED CARBON ON COPPER ELECTRODE MULTISTAGE DEPRESSED COLLECTORS WITH MEDIUM-POWER TRAVELING WAVE TUBES

PETER RAMINS and ARTHUR N. CURREN Nov. 1986 12 p
(NASA-TP-2665; E-3143; NAS 1.60:2665) Avail: NTIS HC A02/MF A01 CSCL 09A

ACCUMULATORS, CURRENT DENSITY, ELECTRODES, ELECTRON EMISSION, TRAVELING WAVE TUBES

N87-17991*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CALCULATION OF SECONDARY ELECTRON TRAJECTORIES IN MULTISTAGE DEPRESSED COLLECTORS FOR MICROWAVE AMPLIFIERS

DALE A. FORCE Nov. 1986 7 p
(NASA-TP-2664; E-3196; NAS 1.60:2664) Avail: NTIS HC A02/MF A01 CSCL 09A

ACCUMULATORS, ELECTRON EMISSION, MICROWAVE AMPLIFIERS, PARTICLE TRAJECTORIES, TRAVELING WAVE TUBES

N87-20474*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DESIGN, FABRICATION AND PERFORMANCE OF SMALL GRAPHITE ELECTRODE, MULTISTAGE DEPRESSED COLLECTORS WITH 200-W, CW, 8-TO 18-GHZ TRAVELING-WAVE TUBES

BEN T. EBIHARA and PETER RAMINS Feb. 1987 22 p
(NASA-TP-2693; E-3099; NAS 1.60:2693) Avail: NTIS HC A02/MF A01 CSCL 09A

ACCUMULATORS, DESIGN ANALYSIS, ELECTRODES, FABRICATION, PYROLYTIC GRAPHITE, TRAVELING WAVE TUBES

N87-21239*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

TRAVELING-WAVE-TUBE EFFICIENCY IMPROVEMENT BY A LOW-COST TECHNIQUE FOR DEPOSITION OF CARBON ON MULTISTAGE DEPRESSED COLLECTOR

BEN T. EBIHARA, PETER RAMINS, and SHELLY PEET May 1987 14 p
(NASA-TP-2719; E-3416; NAS 1.60:2719) Avail: NTIS HC A02/MF A01 CSCL 09A

CARBON, COPPER, DEPOSITION, ELECTRODES, THIN FILMS, TRAVELING WAVE TUBES

N87-22923*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

REVISED NASA AXIALLY SYMMETRIC RING MODEL FOR COUPLED-CAVITY TRAVELING-WAVE TUBES

JEFFREY D. WILSON Jan. 1987 17 p
(NASA-TP-2675; E-3220; NAS 1.60:2675) Avail: NTIS HC A02/MF A01 CSCL 09A

AXISYMMETRIC BODIES, CAVITIES, COUPLED MODES, MODELS, RINGS, TRAVELING WAVE TUBES

N87-25532*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ANALYTICAL AND EXPERIMENTAL PERFORMANCE OF A DUAL-MODE TRAVELING WAVE TUBE AND MULTISTAGE DEPRESSED COLLECTOR

PETER RAMINS, DALE A. FORCE, and HENRY G. KOSMAHL Aug. 1987 29 p
(NASA-TP-2752; E-3470; NAS 1.60:2752) Avail: NTIS HC A03/MF A01 CSCL 09A

ACCUMULATORS, ELECTRON BEAMS, TRAVELING WAVE TUBES

34

FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

N87-11963*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ON THE MAXWELLIAN DISTRIBUTION, SYMMETRIC FORM, AND ENTROPY CONSERVATION FOR THE EULER EQUATIONS

S. M. DESHPANDE Nov. 1986 30 p
(NASA-TP-2583; L-16036; NAS 1.60:2583) Avail: NTIS HC A03/MF A01 CSCL 20D

ENTROPY, EULER EQUATIONS OF MOTION, MAXWELL-BOLTZMANN DENSITY FUNCTION

N87-13664*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AEROTHERMAL TESTS OF SPHERICAL DOME PROTUBERANCES ON A FLAT PLATE AT A MACH NUMBER OF 6.5.

C. E. GLASS and L. R. HUNT Dec. 1986 61 p
(NASA-TP-2631; L-16160; NAS 1.60:2631) Avail: NTIS HC A04/MF A01 CSCL 20D

AEROTHERMODYNAMICS, HYPERSONIC VEHICLES, LAMINAR BOUNDARY LAYER, PREDICTION ANALYSIS TECHNIQUES, PROTUBERANCES, THERMAL PROTECTION, TILES, TURBULENT BOUNDARY LAYER

N87-17000*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SPACE SHUTTLE MAIN ENGINE HIGH PRESSURE FUEL PUMP AFT PLATFORM SEAL CAVITY FLOW ANALYSIS

S. A. LOWRY and L. W. KEETON (CHAM of North America, Inc., Huntsville, Ala.) Jan. 1987 134 p
(NASA-TP-2685; NAS 1.60:2685) Avail: NTIS HC A07/MF A01 CSCL 20D

CAVITIES, FUEL PUMPS, HIGH PRESSURE, SEALS (STOPPERS), SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS

34 FLUID MECHANICS AND HEAT TRANSFER

N87-18034*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
JET MODEL FOR SLOT FILM COOLING WITH EFFECT OF FREE-STREAM AND COOLANT TURBULENCE
FREDERICK F. SIMON Oct. 1986 21 p
(NASA-TP-2655; E-2961; NAS 1.60:2655) Avail: NTIS HC
A02/MF A01 CSCL 20D
FILM COOLING, FLOW VELOCITY, JET ENGINES, NUMERICAL ANALYSIS, TURBULENCE EFFECTS, WALL JETS

N87-18035*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
VELOCITY PROFILES IN LAMINAR DIFFUSION FLAMES
VALERIE J. LYONS and JANICE M. MARGLE (Pennsylvania State Univ., Abington) May 1986 13 p Presented at the Combustion Inst. Meeting, Cleveland, Ohio, 5-6 May 1986
(NASA-TP-2596; E-2879; NAS 1.60:2596) Avail: NTIS HC
A02/MF A01 CSCL 20D
CYCLOHEXANE, DIFFUSION FLAMES, ETHYL ALCOHOL, HEPTANES, LAMINAR FLOW, OCTANES, TEMPERATURE PROFILES, VELOCITY MEASUREMENT

N87-18782*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
AEROTHERMAL EVALUATION OF A SPHERICALLY BLUNTED BODY WITH A TRAPEZOIDAL CROSS SECTION IN THE LANGLEY 8-FOOT HIGH-TEMPERATURE TUNNEL
CINDY W. ALBERTSON Apr. 1987 83 p
(NASA-TP-2641; L-16096; NAS 1.60:2641) Avail: NTIS HC
A05/MF A01 CSCL 20D
BOUNDARY LAYERS, FLOW DISTRIBUTION, HEAT TRANSFER, PREDICTIONS, PRESSURE MEASUREMENT, THERMAL PROTECTION

N87-18783*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
A SECOND-ORDER ACCURATE KINETIC-THEORY-BASED METHOD FOR INVISCID COMPRESSIBLE FLOWS
SURESH M. DESHPANDE Dec. 1986 42 p
(NASA-TP-2613; L-16050; NAS 1.60:2613) Avail: NTIS HC
A03/MF A01 CSCL 20D
BOLTZMANN TRANSPORT EQUATION, EULER EQUATIONS OF MOTION, KINETIC THEORY, NUMERICAL ANALYSIS, SHOCK WAVE PROPAGATION

N87-22103*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACELAB 3 MISSION SCIENCE REVIEW
GEORGE H. FICHTL, ed., JOHN S. THEON, ed. (National Aeronautics and Space Administration, Washington, D.C.), CHARLES K. HILL, ed., and OTHA H. VAUGHAN, ed. Feb. 1987 98 p Symposium held in Huntsville, Ala., 4 Dec. 1985
(NASA-CP-2429; M-547; NAS 1.55:2429) Avail: NTIS HC
A05/MF A01 CSCL 22A
AEROSPACE ENVIRONMENTS, POSTFLIGHT ANALYSIS, REDUCED GRAVITY, SPACE COMMERCIALIZATION, SPACE SHUTTLES, SPACEBORNE EXPERIMENTS, SPACELAB

N87-23921*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THREE-STEP LABYRINTH SEAL FOR HIGH-PERFORMANCE TURBOMACHINES
ROBERT C. HENDRICKS Jun. 1987 75 p
(NASA-TP-1848; E-3186; NAS 1.60:1848) Avail: NTIS HC
A04/MF A01 CSCL 20D
FUEL PUMPS, LABYRINTH SEALS, SPACE SHUTTLE MAIN ENGINE, STATIC TESTS, TURBOMACHINERY

N87-23936*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STRAIGHT CYLINDRICAL SEAL FOR HIGH-PERFORMANCE TURBOMACHINES
ROBERT C. HENDRICKS Jun. 1987 76 p
(NASA-TP-1850; E-3184; NAS 1.60:1850) Avail: NTIS HC
A05/MF A01 CSCL 20D
CYLINDRICAL BODIES, FUEL PUMPS, SEALS (STOPPERS), SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS, TURBOMACHINERY

N87-24639*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THREE-STEP CYLINDRICAL SEAL FOR HIGH-PERFORMANCE TURBOMACHINES
ROBERT C. HENDRICKS Jun. 1987 79 p
(NASA-TP-1849; E-3185; NAS 1.60:1849) Avail: NTIS HC
A05/MF A01 CSCL 20D
DYNAMIC STABILITY, FUEL PUMPS, LEAKAGE, PUMP SEALS, SPACE SHUTTLE MAIN ENGINE, TURBINE PUMPS

N87-24672*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MULTISCALE TURBULENCE EFFECTS IN SUPERSONIC JETS EXHAUSTING INTO STILL AIR
KHALED S. ABDOL-HAMID (Analytical Services and Materials, Inc., Hampton, Va.) and RICHARD G. WILMOTH Jul. 1987 38 p
(NASA-TP-2707; L-16258; NAS 1.60:2707) Avail: NTIS HC
A03/MF A01 CSCL 20D
JET EXHAUST, NAVIER-STOKES EQUATION, SUPERSONIC AIRCRAFT, TURBULENCE

N87-26309*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SIMPLIFIED CURVE FITS FOR THE THERMODYNAMIC PROPERTIES OF EQUILIBRIUM AIR
S. SRINIVASAN, J. C. TANNEHILL (Iowa State Univ. of Science and Technology, Ames.), and K. J. WEILMUENSTER Aug. 1987 48 p
(NAG1-313)
(NASA-RP-1181; L-16276; NAS 1.61:1181) Avail: NTIS HC
A03/MF A01 CSCL 20D

New, improved curve fits for the thermodynamic properties of equilibrium air have been developed. The curve fits are for pressure, speed of sound, temperature, entropy, enthalpy, density, and internal energy. These curve fits can be readily incorporated into new or existing computational fluid dynamics codes if real gas effects are desired. The curve fits are constructed from Grabau-type transition functions to model the thermodynamic surfaces in a piecewise manner. The accuracies and continuity of these curve fits are substantially improved over those of previous curve fits. These improvements are due to the incorporation of a small number of additional terms in the approximating polynomials and careful choices of the transition functions. The ranges of validity of the new curve fits are temperatures up to 25 000 K and densities from 10 to the -7 to 10 to the 3d power amagats. Author

N87-27161*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPLICATION OF TURBULENCE MODELING TO PREDICT SURFACE HEAT TRANSFER IN STAGNATION FLOW REGION OF CIRCULAR CYLINDER
CHI R. WANG and FREDERICK C. YEH Sep. 1987 25 p
(NASA-TP-2758; E-3418; NAS 1.60:2758) Avail: NTIS HC
A02/MF A01 CSCL 20D
CIRCULAR CYLINDERS, HEAT TRANSFER, MODELS, STAGNATION FLOW, SURFACE PROPERTIES, TURBULENCE

34 FLUID MECHANICS AND HEAT TRANSFER

N87-29778*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

DESCRIPTION AND CALIBRATION OF THE LANGLEY HYPERSONIC CF4 TUNNEL: A FACILITY FOR SIMULATING LOW GAMMA FLOW AS OCCURS FOR A REAL GAS

RAYMOND E. MIDDEN and CHARLES G. MILLER, III Mar. 1985 78 p

(NASA-TP-2384; L-15798; NAS 1.60:2384) Avail: NTIS HC A05/MF A01 CSCL 20D

CALIBRATING, CARBON TETRAFLUORIDE, HYPERSONIC WIND TUNNELS, MACH NUMBER, REAL GASES, TEST FACILITIES

N87-29795*# National Aeronautics and Space Administration.
Ames Research Center, Moffett Field, Calif.

FINITE-ELEMENT REENTRY HEAT-TRANSFER ANALYSIS OF SPACE SHUTTLE ORBITER

WILLIAM L. KO, ROBERT D. QUINN, and LESLIE GONG Dec. 1986 59 p

(NASA-TP-2657; H-1236; NAS 1.60:2657) Avail: NTIS HC A04/MF A01 CSCL 20D

AERODYNAMIC HEATING, FINITE ELEMENT METHOD, HEAT TRANSFER COEFFICIENTS, REENTRY SHIELDING, SPACE SHUTTLE ORBITERS, THERMAL ANALYSIS

35

INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

N87-10263*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

THIRTEENTH INTERNATIONAL LASER RADAR CONFERENCE

Aug. 1986 335 p Conference held in Toronto, Ontario, 11-15 Aug. 1986; sponsored by NASA, Washington, D.C., Atmospheric Environment Service, and York Univ.

(NASA-CP-2431; L-16201; NAS 1.55:2431) Avail: NTIS HC A15/MF A01 CSCL 20E

CONFERENCES, LASER APPLICATIONS, LASERS, METEOROLOGICAL PARAMETERS, MIDDLE ATMOSPHERE, OPTICAL RADAR, RADAR EQUIPMENT

N87-13731*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

EVALUATION OF DIFFUSE-ILLUMINATION HOLOGRAPHIC CINEMATOGRAPHY IN A FLUTTER CASCADE

A. J. DECKER Jul. 1986 33 p

(NASA-TP-2593; E-2937; NAS 1.60:2593) Avail: NTIS HC

A03/MF A01 CSCL 14E

CINEMATOGRAPHY, FLOW VISUALIZATION, HOLOGRAPHIC INTERFEROMETRY, HOLOGRAPHY, LASER OUTPUTS, THREE DIMENSIONAL FLOW

N87-20514*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

A SIMPLIFIED METHOD FOR DETERMINING HEAT OF COMBUSTION OF NATURAL GAS

JAG J. SINGH, HOSHANG CHEGINI (Old Dominion Univ., Norfolk, Va.), and GERALD H. MALL (Computer Sciences Corp., Hampton, Va.) Apr. 1987 15 p

(NASA-TP-2682; L-16261; NAS 1.60:2682) Avail: NTIS HC

A02/MF A01 CSCL 14B

GAS DETECTORS, HEAT OF COMBUSTION, NATURAL GAS, OXYGEN SUPPLY EQUIPMENT

36

LASERS AND MASERS

Includes parametric amplifiers.

N87-20522*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

CLOSED-CYCLE, FREQUENCY-STABLE CO₂ LASER TECHNOLOGY

CARMEN E. BATTEN, ed., IRVIN M. MILLER, ed., GEORGE M. WOOD, JR., ed., and DAVID V. WILLETTS, ed. (Royal Signals and Radar Establishment, Malvern, England.) Apr. 1987 279 p Workshop held in Hampton, Va., 10-12 Jun. 1986

(NASA-CP-2456; L-16271; NAS 1.55:2456) Avail: NTIS HC

A13/MF A01 CSCL 20E

CARBON DIOXIDE LASERS, CLOSED CYCLES, FREQUENCY STABILITY, RESEARCH MANAGEMENT

N87-27994*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

FREQUENCY DOMAIN LASER VELOCIMETER SIGNAL PROCESSOR: A NEW SIGNAL PROCESSING SCHEME

JAMES F. MEYERS and JAMES I. CLEMMONS, JR. Sep. 1987 38 p

(NASA-TP-2735; L-16209; NAS 1.60:2735) Avail: NTIS HC

A03/MF A01 CSCL 20E

DOMAINS, FREQUENCIES, LASER DOPPLER VELOCIMETERS, SIGNAL PROCESSING

37

MECHANICAL ENGINEERING

Includes auxiliary systems (nonpower); machine elements and processes; and mechanical equipment.

N87-10391*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

TESTING OF UH-60A HELICOPTER TRANSMISSION IN NASA LEWIS 2240-KW (3000-HP) FACILITY

A. M. MITCHELL, F. B. OSWALD, and H. H. COE Aug. 1986 30 p

(NASA-TP-2626; E-2941; NAS 1.60:2626) Avail: NTIS HC

A03/MF A01 CSCL 13I

HELICOPTERS, TRANSMISSIONS (MACHINE ELEMENTS), VIBRATION MEASUREMENT

N87-18095*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

PREDICTED EFFECT OF DYNAMIC LOAD ON PITTING FATIGUE LIFE FOR LOW-CONTACT-RATIO SPUR GEARS

DAVID G. LEWICKI Jun. 1986 19 p

(NASA-TP-2610; E-2989; NAS 1.60:2610; AD-A170906;

AVSCOM-TR-86-C-21) Avail: NTIS HC A02/MF A01 CSCL 13I

APPLICATIONS PROGRAMS (COMPUTERS), DYNAMIC LOADS, FATIGUE (MATERIALS), GEARS, LIFE (DURABILITY), PITTING

N87-18821*# National Aeronautics and Space Administration,
Washington, D.C.

TETHER DYNAMICS SIMULATION

Feb. 1987 338 p Workshop held in Arlington, Va., 16 Sep.

1986

(NASA-CP-2458; NAS 1.55:2458) Avail: NTIS HC A15/MF A01

CSCL 22B

COMPUTERIZED SIMULATION, ELECTRODYNAMICS, TETHERED SATELLITES, TETHERLINES

N87-20555*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**VIBRATION CHARACTERISTICS OF OH-58A HELICOPTER
MAIN ROTOR TRANSMISSION**

DAVID G. LEWICKI and JOHN J. COY Apr. 1987 18 p
(NASA-TP-2705; E-3368; NAS 1.60:2705; AVSCOM-TR-86-C-42;
AD-A180364) Avail: NTIS HC A01/MF A01 CSCL 01C
HELICOPTERS, ROTOR AERODYNAMICS, TRANSMISSIONS
(MACHINE ELEMENTS), VIBRATION MEASUREMENT

N87-22199*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**ROTORDYNAMIC INSTABILITY PROBLEMS IN HIGH-PERFOR-
MANCE TURBOMACHINERY, 1986**

Jan. 1987 548 p Workshop held in College Station, Tex., 2-4
Jun. 1986; sponsored in cooperation with Texas A&M Univ., Army
Research Office, and Air Force Aeropropulsion Lab.
(NASA-CP-2443; E-3136; NAS 1.55:2443) Avail: NTIS HC
A23/MF A01 CSCL 131

ROTOR AERODYNAMICS, STABILITY, TURBOCOMPRES-
SORS, TURBOMACHINERY

N87-22235*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**GEAR TOOTH STRESS MEASUREMENTS ON THE UH-60A
HELICOPTER TRANSMISSION**

FRED B. OSWALD Mar. 1987 17 p
(NASA-TP-2698; E-3357; NAS 1.60:2698) Avail: NTIS HC
A02/MF A01 CSCL 131

GEAR TEETH, STRESS MEASUREMENT, TRANSMISSIONS
(MACHINE ELEMENTS), UH-60A HELICOPTER

38

QUALITY ASSURANCE AND RELIABILITY

Includes product sampling procedures and techniques; and quality control.

N87-27204*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**ELECTRONICS RELIABILITY AND MEASUREMENT TECHNOL-
OGY**

JOSEPH S. HEYMAN, ed. Aug. 1987 143 p Conference held
in Hampton, Va., 3-5 Jun. 1986; sponsored by NASA Langley
Research Center, USAF, National Security Industrial Association,
and the Aerospace Industry Association
(NASA-CP-2472; L-16315; NAS 1.55:2472) Avail: NTIS HC
A07/MF A01 CSCL 14D

COMPONENT RELIABILITY, INSPECTION, MICROELEC-
TRONICS, NONDESTRUCTIVE TESTS, QUALITY CONTROL, RE-
LIABILITY ENGINEERING

N87-28025*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**A TECHNIQUE FOR EVALUATING THE APPLICATION OF THE
PIN-LEVEL STUCK-AT FAULT MODEL TO VLSI CIRCUITS**

DANIEL L. PALUMBO and GEORGE B. FINELLI Sep. 1987
45 p
(NASA-TP-2738; L-16269; NAS 1.60:2738) Avail: NTIS HC
A03/MF A01 CSCL 14D

COMPUTERS, ERROR ANALYSIS, EVALUATION, FAULT
TOLERANCE, INTEGRATED CIRCUITS, VERY LARGE SCALE
INTEGRATION

39

STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue;
and thermal stress.

N87-11180*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

TURBINE ENGINE HOT SECTION TECHNOLOGY, 1984
Oct. 1984 400 p Conference held in Cleveland, Ohio, 23-24
Oct. 1984
(NASA-CP-2339; E-2267; NAS 1.55:2339) Avail: NTIS HC
A17/MF A01 CSCL 20K
AIRCRAFT ENGINES, AIRFOILS, CONFERENCES, LIFE
(DURABILITY) LININGS, MATHEMATICAL MODELS, PREDICTION
ANALYSIS TECHNIQUES, ROTOR BLADES (TURBOMACHINERY),
TURBINE ENGINES

N87-12921*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

**EFFECTS OF VARIABLES UPON PYROTECHNICALLY INDUCED
SHOCK RESPONSE SPECTRA**

J. L. SMITH May 1986 61 p
(NASA-TP-2603; NAS 1.60:2603) Avail: NTIS HC A04/MF A01
CSCL 20K
PYROTECHNICS, SHOCK LOADS, SHOCK SPECTRA,
VARIABILITY

N87-13789*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**EFFECTS OF WINGLET ON TRANSONIC FLUTTER CHARAC-
TERISTICS OF A CANTILEVERED TWIN-ENGINE-TRANSPORT
WING MODEL**

C. L. RUHLIN, K. G. BHATIA (Boeing Commercial Airplane Co.,
Seattle, Wash.), and K. S. NAGARAJA Dec. 1986 77 p
(NASA-TP-2627; L-16095; NAS 1.60:2627) Avail: NTIS HC
A05/MF A01 CSCL 20K

AERODYNAMIC CONFIGURATIONS, FLUTTER, PREDICTION
ANALYSIS TECHNIQUES, TRANSONIC FLOW, WIND TUNNEL
TESTS, WINGLETS, WINGS

N87-16321*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

THE 20TH AEROSPACE MECHANICS SYMPOSIUM

May 1986 316 p Symposium held in Cleveland, Ohio, 7-9 May
1986; sponsored by NASA, the California Inst. of Tech. and
LMSC
(NASA-CP-2423-REV; E-2904; NAS 1.55:2423-REV) Avail: NTIS
HC A14/MF A01 CSCL 20K
ACTUATORS, CONFERENCES, FLEXIBLE SPACECRAFT,
HYDRAULIC EQUIPMENT, JOINTS (JUNCTIONS), MAN-
IPULATORS, SPACE STATIONS, SPACECRAFT INSTRUMENTS,
SPUTTERING, TRIBOLOGY

N87-18855*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

SENSITIVITY ANALYSIS IN ENGINEERING

HOWARD M. ADELMAN, comp. and RAPHAEL T. HAFTKA, comp.
(Virginia Polytechnic Inst. and State Univ., Blacksburg) Feb.
1987 369 p Symposium held in Hampton, Va., 25-26 Sep.
1986
(NASA-CP-2457; L-16278; NAS 1.55:2457) Avail: NTIS HC
A16/MF A01 CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, EIGENVALUES, MODAL
RESPONSE, OPTIMIZATION, SENSITIVITY

39 STRUCTURAL MECHANICS

N87-20566*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
**SHOT PEENING FOR Ti-6Al-4V ALLOY COMPRESSOR
BLADES**
GERALD A. CAREK Apr. 1987 9 p
(NASA-TP-2711; E-3430; NAS 1.60:2711) Avail: NTIS HC
A01/MF A01 CSCL 20K
ALUMINUM, COMPRESSOR BLADES, SHOT PEENING,
TITANIUM ALLOYS, VANADIUM

N87-20567*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**MODELING OF JOINTS FOR THE DYNAMIC ANALYSIS OF
TRUSS STRUCTURES**
W. KEITH BELVIN May 1987 43 p
(NASA-TP-2661; L-16163; NAS 1.60:2661) Avail: NTIS HC
A03/MF A01 CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, JOINTS (JUNCTIONS),
LARGE SPACE STRUCTURES, MODELS, TRUSSES

N87-20568*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.
**SPACE STATION STRUCTURES AND DYNAMICS TEST
PROGRAM**
CARLETON J. MOORE, JOHN S. TOWNSEND, and EDWARD W.
IVEY Mar. 1987 47 p
(NASA-TP-2710; NAS 1.60:2710) Avail: NTIS HC A03/MF A01
CSCL 20K
DYNAMIC STRUCTURAL ANALYSIS, DYNAMIC TESTS,
LARGE SPACE STRUCTURES, SPACE STATION STRUCTURES,
SPACE STATIONS, SYSTEMS ANALYSIS

N87-27231*# Computer Software Management and Information
Center, Athens, Ga.
FIFTEENTH NASTRAN USERS' COLLOQUIUM
Aug. 1987 312 p Colloquium held in Kansas City, Mo., 4-8
May 1987
(NASW-3247)
(NASA-CP-2481; NAS 1.55:2481) Avail: NTIS HC A14/MF A01;
also available from COSMIC, Athens, Ga. 30602 CSCL 20K
COMPUTER AIDED DESIGN, COMPUTER TECHNIQUES,
CONFERENCES, FINITE ELEMENT METHOD, NASTRAN,
STRUCTURAL ANALYSIS, STRUCTURAL VIBRATION

N87-29858*# National Aeronautics and Space Administration.
Lyndon B. Johnson Space Center, Houston, Tex.
THE 21ST AEROSPACE MECHANISMS SYMPOSIUM
May 1987 356 p Symposium held in Houston, Tex., 29 Apr. -
1 May 1987; sponsored by NASA, California Inst. of Tech., and
LMSC
(NASA-CP-2470; S-560; NAS 1.55:2470) Avail: NTIS HC
A16/MF A01 CSCL 20K
ACTUATORS, DEPLOYMENT, LARGE SPACE STRUCTURES,
MANIPULATORS, ROBOTICS, SPACE ERECTABLE STRUCTURES

42

GEOSCIENCES (GENERAL)

N87-18139*# National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.
**GEOMORPHOLOGY FROM SPACE: A GLOBAL OVERVIEW OF
REGIONAL LANDFORMS**
NICHOLAS M. SHORT, ed. and ROBERT W. BLAIR, JR., ed.
(Fort Lewis A&M Coll., Durango, Colo.) 1986 737 p Original
contains color illustrations
(NASA-SP-486; NAS 1.21:486; LC-86-17974) Avail: SOD HC
\$41.00 as 033-000-00994-1; NTIS MF E03 CSCL 08E

This book, Geomorphology from Space: A Global Overview of Regional Landforms, was published by NASA STIF as a successor to the two earlier works on the same subject: Mission to Earth: LANDSAT views the Earth, and ERTS-1: A New Window on Our Planet. The purpose of the book is threefold: first, to serve as a stimulant in rekindling interest in descriptive geomorphology and landforms analysis at the regional scale; second, to introduce the community of geologists, geographers, and others who analyze the Earth's surficial forms to the practical value of space-acquired remotely sensed data in carrying out their research and applications; and third, to foster more scientific collaboration between geomorphologists who are studying the Earth's landforms and astrogeologists who analyze landforms on other planets and moons in the solar system, thereby strengthening the growing field of comparative planetology.

F.M.R.

43

EARTH RESOURCES AND REMOTE SENSING

Includes remote sensing of earth resources by aircraft and
spacecraft; photogrammetry; and aerial photography.

N87-22281*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**SURFACE BIDIRECTIONAL REFLECTANCE PROPERTIES OF
TWO SOUTHWESTERN ARIZONA DESERTS FOR
WAVELENGTHS BETWEEN 0.4 AND 2.2 MICROMETERS**
CHARLES H. WHITLOCK, G. CARLTON PURGOLD, and STUART
R. LECROY (PRC Kentron, Inc., Hampton, Va.) May 1987
48 p
(NASA-TP-2643; L-16159; NAS 1.60:2643) Avail: NTIS HC
A03/MF A01 CSCL 20F
ALBEDO, BIDIRECTIONAL REFLECTANCE, DESERTS,
DIRECTIVITY, SOLAR POSITION, ZENITH

N87-27315* National Aeronautics and Space Administration,
Washington, D.C.
**EARTH RESOURCES: A CONTINUING BIBLIOGRAPHY WITH
INDEXES (ISSUE 54)**
Aug. 1987 164 p
(NASA-SP-7041(54); NAS 1.21:7041(54)) Avail: NTIS HC A08
CSCL 05B

This bibliography lists 562 reports, articles, and other documents introduced into the NASA scientific and technical information system between April 1 and June 30, 1987. Emphasis is placed on the use of remote sensing and geophysical instrumentation in spacecraft and aircraft to survey and inventory natural resources and urban areas. Subject matter is grouped according to agriculture and forestry, environmental changes and cultural resources, geodesy and cartography, geology and mineral resources, hydrology and water management, data processing and distribution

systems, instrumentation and sensors, and economic analysis.
Author

N87-28162*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.
**EFFECTS OF AEROSOLS AND SURFACE SHADOWING ON
BIDIRECTIONAL REFLECTANCE MEASUREMENTS OF
DESERTS**

DAVID E. BOWKER and RICHARD E. DAVIS Sep. 1987 26 p
(NASA-TP-2756; L-16327; NAS 1.60:2756) Avail: NTIS HC
A03/MF A01 CSCL 04A
AEROSOLS, BIDIRECTIONAL REFLECTANCE, DESERTS,
DUST, REMOTE SENSING, SHADOWS, SURFACE PROPERTIES

N87-28955*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**ATLAS OF ABSORPTION LINES FROM 0 TO 17900 CM
(SUP)-1**

J. H. PARK, L. S. ROTHMAN, C. P. RINSLAND, H. M. PICKETT,
D. J. RICHARDSON, and J. S. NAMKUNG (ST Systems Corp.,
Hampton, Va.) Sep. 1987 197 p
(NASA-RP-1188; L-16330; NAS 1.61:1188) Avail: NTIS HC
A09/MF A01 CSCL 04A

Plots of logarithm (base 10) of absorption line strength versus wavenumber from 0 to 17900/cm(sup)-1 are shown for the 28 atmospheric gases (H₂O, CO₂, O₃, N₂O, CO, CH₄, O₂, NO, SO₂, NO₂, NH₃, HNO₃, OH, HF, HCl, HBr, HI, ClO, OCS, H₂CO, HOCl, N₂, HCN, CH₃Cl, H₂O₂, C₂H₂, C₂H₆, PH₃), which appear in the 1986 Air Force Geophysics Laboratory high-resolution transmission molecular absorption data base (HITRAN) compilation, and for O(P-3), O-18 isotopic ozone, and HO₂ from the 1984 JPL compilation in the 0- to 200/cm(sup)-1 region, and infrared solar CO lines at 4500 K. Also shown are plots of logarithm (base 10) of approximate infrared absorption cross sections of 11 heavy molecules versus wavenumber. The cross-section data cover 700 to 1800/cm(sup)-1 and are included as a separate data file in the 1986 HITRAN database.

Author

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ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells; global sources of energy; geophysical conversion; and windpower.

N87-26413*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**SPACE PHOTOVOLTAIC RESEARCH AND TECHNOLOGY 1986.
HIGH EFFICIENCY, SPACE ENVIRONMENT, AND ARRAY
TECHNOLOGY**

Jun. 1987 375 p Conference held in Cleveland, Ohio, 7-9 Oct.
1986
(NASA-CP-2475; E-3450; NAS 1.55:2475) Avail: NTIS HC
A16/MF A01 CSCL 10B

CONFERENCES, ENERGY CONVERSION EFFICIENCY,
PHOTOVOLTAIC CONVERSION, SOLAR CELLS, SPACECRAFT
POWER SUPPLIES

N87-29914*# National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.

**SPACE ELECTROCHEMICAL RESEARCH AND TECHNOLOGY
(SERT)**

Sep. 1987 364 p Conference held in Cleveland, Ohio, 14-16
Apr. 1987
(NASA-CP-2484; E-3506; NAS 1.55:2484) Avail: NTIS HC
A16/MF A01 CSCL 10C

ELECTRIC BATTERIES, ELECTROCATALYSTS, ELECTRO-
CHEMISTRY, MATHEMATICAL MODELS, REGENERATIVE FUEL
CELLS

46

GEOPHYSICS

Includes aeronomy; upper and lower atmosphere studies;
ionospheric and magnetospheric physics; and geomagnetism.

N87-11358*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**AIRBORNE LIDAR MEASUREMENTS OF EL CHICHON
STRATOSPHERIC AEROSOLS, MAY 1983**

M. P. MCCORMICK and M. T. OSBORN (SASC Technologies,
Inc., Hampton, Va.) Oct. 1986 91 p
(NASA-RP-1172; L-16176; NAS 1.61:1172) Avail: NTIS HC
A05/MF A01

An experimental survey flight to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric aerosol was conducted in May 1983. The mission included several different sensors flown aboard the NASA Convair 990 at latitudes between 72 deg. and 56 deg. S. This report presents the lidar data from that flight mission. Representative profiles of lidar backscatter ratio, plots of integrated backscattering function versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are given. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are supplied for each profile. By May 1983, material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes covered by this mission. However, the most massive portion of the material resided north of 33 deg. N and was concentrated below 21 km. In this latitude region (33 deg. N to 72 deg. N), peak backscatter ratios at a wavelength of 0.6943 microns varied between 3.5 and 4.5, and the peak integrated backscattering function was about 18 X 10 to the -4 power/sr, corresponding to a peak optical depth calculated to be approximately 0.08. This report presents the results of this mission in a ready-to-use format for atmospheric and climatic studies.

Author

N87-13022*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**DESCRIPTION OF DATA ON THE NIMBUS 7 LIMS MAP
ARCHIVE TAPE: OZONE AND NITRIC ACID**

E. E. REMSBERG, R. J. KURZEJA, K. V. HAGGARD, J. M.
RUSSELL, III, and L. L. GORDLEY Dec. 1986 73 p
(NASA-TP-2625; L-16136; NAS 1.60:2625) Avail: NTIS HC
A04/MF A01 CSCL 04A

INFRARED DETECTORS, KALMAN FILTERS, NIMBUS 7
SATELLITE, NITRIC ACID, OZONE, STRATOSPHERE

N87-15528*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

FUTURE DIRECTIONS FOR H SUB X O SUB Y DETECTION

DAVID R. CROSLEY, ed. (SRI International Corp., Menlo Park,
Calif.) and JAMES M. HOELL, ed. Dec. 1986 67 p Workshop
held in Menlo Park, Calif., 12-15 Aug. 1985
(NASA-CP-2448; L-16216; NAS 1.55:2448) Avail: NTIS HC
A04/MF A01 CSCL 04A

ATMOSPHERIC COMPOSITION, HYDROGEN PEROXIDE,
HYDROXYL RADICALS, TROPOSPHERE, WATER

N87-17417*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**SAGE AEROSOL MEASUREMENTS. VOLUME 3: JANUARY 1,
1981 TO NOVEMBER 18, 1981**

M. PATRICK MCCORMICK Feb. 1987 274 p
(NASA-RP-1173; L-16177; NAS 1.61:1173) Avail: NTIS HC
A12/MF A01 CSCL 04A

The Stratospheric Aerosol and Gas Experiment (SAGE) satellite system, launched February 18, 1979, obtained profiles of aerosol extinction at 1.00 micron and 0.45 micron ozone concentration, and nitrogen dioxide concentration. Data taken during sunset events are presented in the form of zonal and seasonal averages of

46 GEOPHYSICS

aerosol extinction of 1.00 micron and 0.45 micron, ratios of aerosol extinction to molecular extinction at 1.00 micron and ratios of aerosol extinction at 0.45 micron to aerosol extinction at 1.00 micron. Averages for 1981 are shown in tables, and in profile and contour plots (as a function of altitude and latitude). In addition, temperature data provided by NOAA for the time and location of each SAGE measurement are averaged and shown in a similar format. The stratospheric aerosol distribution for 1981 shows effects of volcanically injected material from eruptions of Ulawun, Alaid, and Pagan. Peak values of aerosol extinction at 0.45 micron and 1.00 micron were 2 to 4 times higher than typical peak values observed during near background conditions. Stratospheric aerosol optical depth values at 1.00 microns increased by a factor of about 2 from near background levels in regions of volcanic activity. During the year, these values ranged from between 0.001 and 0.006. The largest were near the location of a recent eruption. The distribution of the ratio of aerosol to molecular extinction at 1.00 microns also showed that maximum values are found in the vicinity of an eruption. These maximums varied in altitude, but remained below a height of about 25 km. No attempt has been made to give detailed explanations or interpretations of these data. The intent is to provide, in a ready-to-use visual format, representative zonal and seasonal averages of aerosol extinction data for the third calendar year of the SAGE data set to facilitate atmospheric and climatic studies.

Author

N87-18248*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SPACE OPPORTUNITIES FOR TROPOSPHERIC CHEMISTRY RESEARCH

JOEL S. LEVINE, ed. Feb. 1987 92 p Workshop held in New York, N.Y., 9-13 Sep. 1985
(NASA-CP-2450; L-16250; NAS 1.55:2450) Avail: NTIS HC A05/MF A01 CSCL 04A

AEROSOLS, AIR POLLUTION, ATMOSPHERIC CHEMISTRY, ATMOSPHERIC COMPOSITION, CONFERENCES, GASES, REMOTE SENSING, TROPOSPHERE

N87-20663*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AIRBORNE LIDAR MEASUREMENTS OF EL CHICHON STRATOSPHERIC AEROSOLS, JANUARY 1984

M. PATRICK MCCORMICK and M. T. OSBORN (ST Systems Corp., Hampton, Va.) Apr. 1987 49 p
(NASA-RP-1175; L-16234; NAS 1.61:1175) Avail: NTIS HC A03/MF A01 CSCL 04A

A lidar-equipped NASA Electra aircraft was flown in January 1984 between the latitude of 38 and 90 deg N. One of the primary purposes of this mission was to determine the spatial distribution and aerosol characteristics of El Chichon produced stratospheric material. Lidar data from that portion of the flight mission between 38 deg N and 77 deg N is presented. Representative profiles of lidar backscatter ratio, a plot of the integral backscattering function versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are given. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are applied for each profile. These data clearly show that material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes covered by this mission, and that the most massive portion of the material resided north of 55 deg N and was concentrated below 17 km in a layer that peaked at 13 to 15 km. In this latitude region, peak backscatter ratios at a wavelength of 0.6943 microns were approximately 3 and the peak integrated backscattering function was about 15 X 10 to the -4/sr corresponding to a peak optical depth of approximately 0.07. This report presents the results of this mission in a ready-to-use format for atmospheric and climatic studies.

Author

N87-20665*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

UPPER AND MIDDLE ATMOSPHERIC DENSITY MODELING REQUIREMENTS FOR SPACECRAFT DESIGN AND OPERATIONS

M. H. DAVIS, ed. (Universities Space Research Association, Boulder, Colo.), R. E. SMITH, ed., and D. L. JOHNSON, ed. Feb. 1987 290 p Workshop held in Huntsville, Ala., 19-21 1985 (NAS8-36400)

(NASA-CP-2460; M-548; NAS 1.55:2460) Avail: NTIS HC

A13/MF A01 CSCL 04A

AEROSPACE ENVIRONMENTS, ATMOSPHERIC DENSITY, ATMOSPHERIC MODELS, SPACECRAFT DESIGN, THERMOSPHERE

47

METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N87-12086*# National Aeronautics and Space Administration. Wallops Flight Center, Wallops Island, Va.

PRELIMINARY ESTIMATES OF RADIOSONDE THERMISTOR ERRORS

F. J. SCHMIDLIN, J. K. LUERS (Dayton Univ., Ohio.), and P. D. HUFFMAN Washington, D.C. Sep. 1986 19 p
(NASA-TP-2637; NAS 1.60:2637) Avail: NTIS HC A02/MF A01 CSCL 04B

ERROR ANALYSIS, RADIOSONDES, THERMISTORS

N87-13043*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

NASA/MSFC FY-85 ATMOSPHERIC PROCESSES RESEARCH REVIEW

W. W. VAUGHAN, comp. and F. PORTER, comp. Oct. 1985 143 p Review held in Huntsville, Ala. 7-9 May 1985 and in Columbia, Md., 8-12 Jul. 1985
(NASA-CP-2402; M-503; NAS 1.55:2402) Avail: NTIS HC A07/MF A01 CSCL 04B

ATMOSPHERIC ELECTRICITY, ATMOSPHERIC SOUNDING, DATA PROCESSING, DOPPLER RADAR, GEOPHYSICS, MESOSCALE PHENOMENA, OPTICAL RADAR, SATELLITE IMAGERY, THUNDERSTORMS, WIND (METEOROLOGY)

N87-20701*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

ON REQUIREMENTS FOR A SATELLITE MISSION TO MEASURE TROPICAL RAINFALL

OTTO W. THIELE, ed. Apr. 1987 67 p
(NASA-RP-1183; NAS 1.61:1183) Avail: NTIS HC A04/MF A01 CSCL 04B

Tropical rainfall data are crucial in determining the role of tropical latent heating in driving the circulation of the global atmosphere. Also, the data are particularly important for testing the realism of climate models, and their ability to simulate and predict climate accurately on the seasonal time scale. Other scientific issues such as the effects of El Nino on climate could be addressed with a reliable, extended time series of tropical rainfall observations. A passive microwave sensor is planned to provide information on the integrated column precipitation content, its areal distribution, and its intensity. An active microwave sensor (radar) will define the layer depth of the precipitation and provide information about the intensity of rain reaching the surface, the key to determining the latent heat input to the atmosphere. A visible/infrared sensor will provide very high resolution information on cloud coverage, type, and top temperatures and also serve as the link between these data and the long and virtually continuous coverage by the geosynchronous meteorological satellites. The unique combination of sensor wavelengths, coverages, and resolving capabilities

together with the low-altitude, non-Sun synchronous orbit provide a sampling capability that should yield monthly precipitation amounts to a reasonable accuracy over a 500- by 500-km grid.

Author

N87-22341*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ATMOSPHERIC TURBULENCE RELATIVE TO AVIATION, MISSILE, AND SPACE PROGRAMS

DENNIS W. CAMP, ed. and WALTER FROST, ed. (FWG Associates, Inc., Tullahoma, Tenn.) Apr. 1987 257 p Workshop held in Hampton, Va., 2-4 Apr. 1986
(NASA-CP-2468; L-16296; NAS 1.55:2468) Avail: NTIS HC A12/MF A01 CSCL 04B

AIRCRAFT SAFETY, ATMOSPHERIC MODELS, ATMOSPHERIC TURBULENCE, CONFERENCES, MISSILES, SPACE PROGRAMS, WEATHER FORECASTING

N87-26489*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ATLAS OF WIDE-FIELD-OF-VIEW OUTGOING LONGWAVE RADIATION DERIVED FROM NIMBUS 6 EARTH RADIATION BUDGET DATA SET, JULY 1975 TO JUNE 1978

T. DALE BESS and G. LOUIS SMITH Aug. 1987 80 p
(NASA-RP-1185; L-16325; NAS 1.61:1185) Avail: NTIS HC A05/MF A01 CSCL 04B

An atlas of monthly mean outgoing longwave radiation global contour maps and associated spherical harmonic coefficients is presented. The atlas contains 36 months of continuous data from July 1975 to June 1978. The data were derived from the first Earth radiation budget experiment, which was flown on the Nimbus-6 Sun-synchronous satellite in 1975. Only the wide-field-of-view longwave measurements are cataloged in this atlas. The contour maps along with the associated sets of spherical harmonic coefficients form a valuable data set for studying different aspects of our changing climate over monthly, annual, and interannual scales in the time domain, and over regional, zonal, and global scales in the spatial domain.

Author

N87-26491*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

CALIBRATION OF THE SPIN-SCAN OZONE IMAGER ABOARD THE DYNAMICS EXPLORER 1 SATELLITE

WALTER E. BRESSETTE, GERALD M. KEATING, and DAVID F. YOUNG (ST Systems Corp., Hampton, Va.) Aug. 1987 44 p
(NASA-TP-2723; L-16150; NAS 1.60:2723) Avail: NTIS HC A03/MF A01 CSCL 04B

ALGORITHMS, CALIBRATING, DYNAMICS EXPLORER 1 SATELLITE, OZONE, REGRESSION ANALYSIS, ULTRAVIOLET SPECTROMETERS

N87-29996*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

FIVE YEAR GLOBAL DATASET: NMC OPERATIONAL ANALYSES (1978 TO 1982)

DAVID STRAUS and JOSEPH ARDIZZONE Sep. 1987 50 p Prepared in cooperation with Sigma Data Services Corp., Rockville, Md.
(NASA-RP-1194; REPT-87B0273; NAS 1.61:1194) Avail: NTIS HC A03/MF A01 CSCL 04B

This document describes procedures used in assembling a five year dataset (1978 to 1982) using NMC Operational Analysis data. These procedures entailed replacing missing and unacceptable data in order to arrive at a complete dataset that is continuous in time. In addition, a subjective assessment on the integrity of all data (both preliminary and final) is presented. Documentation on tapes comprising the Five Year Global Dataset is also included.

Author

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OCEANOGRAPHY

Includes biological, dynamic, and physical oceanography; and marine resources.

N87-24870*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

ARCTIC SEA ICE, 1973-1976: SATELLITE PASSIVE-MICROWAVE OBSERVATIONS

CLAIRE L. PARKINSON, JOSEFINO C. COMISO, H. JAY ZWALLY, DONALD J. CAVALIERI, PER GLOERSEN, and WILLIAM J. CAMPBELL (Puget Sound Univ., Tacoma, Wash.) Jan. 1987 301 p Original contains color illustrations
(NASA-SP-489; NAS 1.21:489; LC-86-23876) Avail: NTIS HC A14 CSCL 08L

The Arctic region plays a key role in the climate of the earth. The sea ice cover affects the radiative balance of the earth and radically changes the fluxes of heat between the atmosphere and the ocean. The observations of the Arctic made by the Electrically Scanning Microwave Radiometer (ESMR) on board the Nimbus 5 research satellite are summarized for the period 1973 through 1976.

B.G.

51

LIFE SCIENCES (GENERAL)

N87-20727*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

LIQUID DROP STABILITY FOR PROTEIN CRYSTAL GROWTH IN MICROGRAVITY

ROBERT B. OWEN, BETH H. BROOM, ROBERT S. SNYDER, and RON DANIEL Apr. 1987 17 p
(NASA-TP-2724; NAS 1.60:2724) Avail: NTIS HC A02/MF A01 CSCL 06B

CRYSTAL GROWTH, DROPS (LIQUIDS), MICROGRAVITY APPLICATIONS, PROTEIN SYNTHESIS, STABILITY

52

AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

N87-18976*# National Aeronautics and Space Administration, Washington, D.C.

AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE INDEX TO THE 1986 ISSUES (SUPPLEMENT 293)

Jan. 1987 251 p
(NASA-SP-7011(293); NAS 1.21:7011(293)) Avail: NTIS HC A12 CSCL 06E

This publication is a cumulative index to the abstracts contained in the Supplements 281 through 292 of Aerospace Medicine and Biology: A Continuing Bibliography. It includes seven indexes - subject, personal author, corporate source, foreign technology, contract number, report number, and accession number.

Author

52 AEROSPACE MEDICINE

N87-30041* National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES (SUPPLEMENT 302)
Oct. 1987 55 p
(NASA-SP-7011(302); NAS 1.21:7011(302)) Avail: HC A04
CSCL 06E

This bibliography lists 131 reports, articles, and other documents introduced into the NASA scientific and technical information system in September, 1987.

Author

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COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms, and specific applications, e.g., CAD/CAM.

N87-10720*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

PROCEEDINGS OF THE 5TH ANNUAL USERS' CONFERENCE
M. SZCZUR, ed. and E. HARRIS, ed. 1985 400 p Conference held at Greenbelt, Md., 4-6 Jun. 1985
(NASA-CP-2399; NAS 1.55:2399) Avail: NTIS HC A17/MF A01
CSCL 09B

ACCESS CONTROL, COMPUTER NETWORKS, FORMAT, IMAGE PROCESSING, ORBITAL SPACE STATIONS, SOFTWARE ENGINEERING, SOFTWARE TOOLS

N87-19931*# National Aeronautics and Space Administration, Washington, D.C.

COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 1
Mar. 1987 356 p Proceedings of a Symposium held in Williamsburg, Va., 18-20 Nov. 1986
(NASA-CP-2459-VOL-1; NAS 1.55:2459-VOL-1) Avail: NTIS HC A16/MF A01 CSCL 09B

ARCHITECTURE (COMPUTERS), CONCURRENT PROCESSING, CONFERENCES, DATA MANAGEMENT, DISTRIBUTED PROCESSING, EXPERT SYSTEMS, SOFTWARE ENGINEERING

N87-19932*# National Aeronautics and Space Administration, Washington, D.C.

COMPUTER SCIENCES AND DATA SYSTEMS, VOLUME 2
Mar. 1987 339 p Proceedings of a Symposium held in Williamsburg, Va., 18-20 Nov. 1986
(NASA-CP-2459-VOL-2; NAS 1.55:2459-VOL-2) Avail: NTIS HC A15/MF A01 CSCL 09B
CONFERENCES, DATA STORAGE, DISTRIBUTED PROCESSING, FIBER OPTICS, OPTICAL DATA PROCESSING, PARALLEL PROCESSING (COMPUTERS), VHSC (CIRCUITS)

N87-23156*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

SIXTH ANNUAL USERS' CONFERENCE
MARTHA SZCZUR, ed. and ELFRIEDA HARRIS, ed. (Science Applications Research, Lanham, Md.) Oct. 1986 228 p Conference held in Pasadena, Calif., 8-10 Oct. 1986; sponsored by JPL and NASA. Goddard Space Flight Center
(NASA-CP-2463; REPT-87B0176; NAS 1.55:2463) Avail: NTIS HC A11/MF A01 CSCL 09B

APPLICATIONS PROGRAMS (COMPUTERS), COMPUTER SYSTEMS PROGRAMS, CONFERENCES, IMAGE PROCESSING, INFORMATION SYSTEMS, MAN-COMPUTER INTERFACE, OPERATING SYSTEMS (COMPUTERS)

22

N87-26531*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

FRONTIERS OF MASSIVELY PARALLEL SCIENTIFIC COMPUTATION

JAMES R. FISCHER, ed. Jul. 1987 293 p Symposium held in Greenbelt, Md., 24-25 Sep. 1986; sponsored by NASA Goddard Space Flight Center and Goodyear Aerospace Corp.
(NASA-CP-2478; REPT-87B9876; NAS 1.55:2478) Avail: NTIS HC A13/MF A01 CSCL 09B

ALGORITHMS, COMPUTER GRAPHICS, COMPUTER SYSTEMS PERFORMANCE, COMPUTERIZED SIMULATION, PARALLEL COMPUTERS, PARALLEL PROCESSING (COMPUTERS)

62

COMPUTER SYSTEMS

Includes computer networks and special application computer systems.

N87-23202*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

APPLICATIONS AND REQUIREMENTS FOR REAL-TIME SIMULATORS IN GROUND-TEST FACILITIES

DALE J. ARPASI and RICHARD A. BLECH Dec. 1986 26 p
(NASA-TP-2672; E-3189; NAS 1.60:2672) Avail: NTIS HC A03/MF A01 CSCL 09B

GROUND TESTS, REAL TIME OPERATION, SIMULATORS, TEST FACILITIES

64

NUMERICAL ANALYSIS

Includes iteration, difference equations, and numerical approximation.

N87-14054*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

SOME PATH-FOLLOWING TECHNIQUES FOR SOLUTION OF NONLINEAR EQUATIONS AND COMPARISON WITH PARAMETRIC DIFFERENTIATION

R. L. BARGER and R. W. WALTERS (Virginia Polytechnic Inst. and State Univ., Blacksburg.) 1986 16 p
(NASA-TP-2654; L-16199; NAS 1.60:2654) Avail: NTIS HC A02/MF A01 CSCL 12A

COMPUTER PROGRAMMING, CRITICAL PATH METHOD, DIFFERENTIAL EQUATIONS, NONLINEAR EQUATIONS, PARAMETER IDENTIFICATION

N87-14918*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOLUTION OF ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS BY FAST POISSON SOLVERS USING A LOCAL RELAXATION FACTOR. 2: TWO-STEP METHOD

S. C. CHANG May 1986 17 p
(NASA-TP-2530; E-2528-1; NAS 1.60:2530) Avail: NTIS HC A02/MF A01 CSCL 12A

ELLIPTIC DIFFERENTIAL EQUATIONS, ELLIPTIC FUNCTIONS, PARTIAL DIFFERENTIAL EQUATIONS, PROBLEM SOLVING

N87-22441*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**QUANTITATIVE ANALYSIS OF THE RECONSTRUCTION
PERFORMANCE OF INTERPOLANTS**

DONALD L. LANSING and STEPHEN K. PARK (College of William and Mary, Williamsburg, Va.) May 1987 35 p
(NASA-TP-2688; L-16164; NAS 1.60:2688) Avail: NTIS HC
A03/MF A01 CSCL 12A
INTERPOLATION, QUANTITATIVE ANALYSIS, RECONSTRUCTION

N87-22447*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

AN ALGORITHM FOR SURFACE SMOOTHING WITH RATIONAL SPLINES

JAMES R. SCHIESS Jun. 1987 17 p
(NASA-TP-2708; L-16272; NAS 1.60:2708) Avail: NTIS HC
A02/MF A01 CSCL 12A
ALGORITHMS, RATIONAL FUNCTIONS, SMOOTHING,
SPLINE FUNCTIONS, SURFACE ROUGHNESS

N87-28367*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

EXPERIMENTS IN ENCODING MULTILEVEL IMAGES AS QUADTREES

DONALD L. LANSING Sep. 1987 60 p
(NASA-TP-2722; L-16292; NAS 1.60:2722) Avail: NTIS HC
A04/MF A01 CSCL 12A
CODING, DATA COMPRESSION, DATA STORAGE, GRAY SCALE, IMAGE PROCESSING

65

STATISTICS AND PROBABILITY

Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

N87-23244*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

DEVELOPMENT OF CONFIDENCE LIMITS BY PIVOTAL FUNCTIONS FOR ESTIMATING SOFTWARE RELIABILITY

KELLY J. DOTSON Jun. 1987 12 p
(NASA-TP-2709; L-16264; NAS 1.60:2709) Avail: NTIS HC
A02/MF A01 CSCL 12A
CONFIDENCE LIMITS, FAILURE ANALYSIS, PREDICTIONS, RELIABILITY ANALYSIS, SOFTWARE ENGINEERING

N87-27474*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

PROBABILISTIC RISK ANALYSIS OF FLYING THE SPACE SHUTTLE WITH AND WITHOUT FUEL TURBINE DISCHARGE TEMPERATURE REDLINE PROTECTION

LEONARD HOWELL Aug. 1987 22 p
(NASA-TP-2759; NAS 1.60:2759) Avail: NTIS HC A02/MF A01
CSCL 12A
ENGINE FAILURE, MATHEMATICAL MODELS, SPACE SHUTTLE MAIN ENGINE, SPACECRAFT RELIABILITY, STOCHASTIC PROCESSES, TEMPERATURE SENSORS

71

ACOUSTICS

Includes sound generation, transmission, and attenuation.

N87-14120*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

EFFECTS OF BACKGROUND NOISE ON TOTAL NOISE ANNOYANCE

K. F. WILLSHIRE Jan. 1987 59 p
(NASA-TP-2630; L-16153; NAS 1.60:2630) Avail: NTIS HC
A04/MF A01 CSCL 46A
BACKGROUND NOISE, EFFECTIVE PERCEIVED NOISE LEVELS, NOISE INTENSITY, NOISE POLLUTION, NOISE TOLERANCE

N87-17479*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

POWER CEPSTRUM TECHNIQUE WITH APPLICATION TO MODEL HELICOPTER ACOUSTIC DATA

R. M. MARTIN and C. L. BURLEY Washington Jun. 1986
68 p
(NASA-TP-2586; L-16070; NAS 1.60:2586) Avail: NTIS HC
A04/MF A01 CSCL 20A
ACOUSTIC MEASUREMENT, CEPSTRAL ANALYSIS,
HELICOPTERS, MODELS, SIGNAL REFLECTION

N87-18399*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

CORRELATION OF HELICOPTER IMPULSIVE NOISE FROM BLADE-VORTEX INTERACTION WITH ROTOR MEAN INFLOW

ANDREW B. CONNOR and R. M. MARTIN Mar. 1987 23 p
(NASA-TP-2650; L-16145; NAS 1.60:2650) Avail: NTIS HC
A02/MF A01 CSCL 20A

BLADE SLAP NOISE, BLADE-VORTEX INTERACTION, ROTOR BLADES (TURBOMACHINERY), VORTICES, WIND TUNNEL TESTS

N87-20798*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

EXPERIMENTAL VALIDATION OF A TWO-DIMENSIONAL SHEAR-FLOW MODEL FOR DETERMINING ACOUSTIC IMPEDANCE

TONY L. PARROTT, WILLIE R. WATSON, and MICHAEL G. JONES (PRC Kentron, Inc., Hampton, Va.) May 1987 50 p
(NASA-TP-2679; L-16203; NAS 1.60:2679) Avail: NTIS HC
A03/MF A01 CSCL 20A
ACOUSTIC IMPEDANCE, MODELS, SHEAR FLOW, TWO DIMENSIONAL FLOW

N87-24161*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

ANNOYANCE RESPONSE TO SIMULATED ADVANCED TURBOPROP AIRCRAFT INTERIOR NOISE CONTAINING TONAL BEATS

JACK D. LEATHERWOOD Jul. 1987 28 p
(NASA-TP-2689; L-16184; NAS 1.60:2689) Avail: NTIS HC
A03/MF A01 CSCL 20A
AIRCRAFT COMPARTMENTS, AIRCRAFT NOISE, HUMAN TOLERANCES, PSYCHOLOGICAL EFFECTS, RESPONSES

73 NUCLEAR AND HIGH-ENERGY PHYSICS

73

NUCLEAR AND HIGH-ENERGY PHYSICS

Includes elementary and nuclear particles; and reactor theory.

N87-17487*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

DOUBLY DIFFERENTIAL CROSS SECTIONS FOR GALACTIC HEAVY-ION FRAGMENTATION

FRANCIS A. CUCINOTTA (Old Dominion Univ., Norfolk, Va.), JOHN W. NORBURY, GOVIND S. KHANDELWAL, and LAWRENCE W. TOWNSEND Feb. 1987 23 p
(NASA-TP-2659; L-16187; NAS 1.60:2659) Avail: NTIS HC A02/MF A01 CSCL 20H

COLLISION PARAMETERS, GALAXIES, HEAVY IONS, PARTICLE COLLISIONS, SCATTERING CROSS SECTIONS

N87-24977*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

POSSIBLE COMPLEMENTARY COSMIC-RAY SYSTEMS: NUCLEI AND ANTINUCLEI

WARREN W. BUCK, JOHN W. WILSON, LAWRENCE W. TOWNSEND, and JOHN W. NORBURY (Idaho Univ., Moscow.) Jul. 1987 47 p
(NASA-TP-2741; L-16275; NAS 1.60:2741) Avail: NTIS HC A03/MF A01 CSCL 20H

ANTIMATTER, ANTI PARTICLES, GALACTIC COSMIC RAYS, HEAVY IONS, NUCLEI (NUCLEAR PHYSICS)

74

OPTICS

Includes light phenomena; and optical devices.

N87-13264*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

THEORY FOR COMPUTING THE FIELD SCATTERED FROM A SMOOTH INFLECTED SURFACE

R. L. BARGER and A. K. DOMINEK 1986 23 p
(NASA-TP-2632; L-16157; NAS 1.60:2632) Avail: NTIS HC A01/MF A01 CSCL 20F

BODIES OF REVOLUTION, ELECTROMAGNETIC RADIATION, MICROWAVES, REFLECTANCE, SURFACE PROPERTIES, WAVE SCATTERING

75

PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion.

N87-10764*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LASER-POWERED MHD GENERATORS FOR SPACE APPLICATION

N. W. JALUFKA Oct. 1986 15 p
(NASA-TP-2621; NAS 1.60:2621) Avail: NTIS HC A02/MF A01 CSCL 20I

ENERGY CONVERSION EFFICIENCY, LASER PLASMA INTERACTIONS, MAGNETOHYDRODYNAMIC GENERATORS

N87-14998*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ASYMPTOTIC ANALYSIS OF CORONA DISCHARGE FROM THIN ELECTRODES

P. A. DURBIN Sep. 1986 7 p
(NASA-TP-2645; E-3151; NAS 1.60:2645) Avail: NTIS HC A02/MF A01 CSCL 20I

ASYMPTOTIC METHODS, ELECTRIC CORONA, ELECTRIC DISCHARGES, ELECTRODES

81

ADMINISTRATION AND MANAGEMENT

Includes management planning and research.

N87-20833* National Aeronautics and Space Administration, Washington, D.C.

MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS (SUPPLEMENT 21)

Apr. 1987 70 p
(NASA-SP-7500(21); NAS 1.21:7500(21)) Avail: NTIS HC A04 CSCL 05A

This bibliography lists 664 reports, articles and other documents introduced into the NASA scientific and technical information system in 1986. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. Author

82

DOCUMENTATION AND INFORMATION SCIENCE

Includes information management; information storage and retrieval technology; technical writing; graphic arts; and micrography.

N87-25023* National Aeronautics and Space Administration, Washington, D.C.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 1: ABSTRACTS (SUPPLEMENT 31)

Jul. 1987 45 p
(NASA-SP-7039(31); NAS 1.21:7039(31)) Avail: NTIS HC A03; NTIS standing order as PB86-911100, \$11.50 domestic, \$23.00 foreign CSCL 05B

Abstracts are provided for 85 patents and patent applications entered into the NASA scientific and technical information system during the period January 1987 through June 1987. Each entry consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or patent application. Author

N87-26689* National Aeronautics and Space Administration, Washington, D.C.

NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY. SECTION 2: INDEXES (SUPPLEMENT 31)

Jul. 1987 493 p
(NASA-SP-7039(31)-SECT-2; NAS 1.21:7039(31)-SECT-2) Avail: NTIS HC A21 CSCL 05B

A subject index is provided for over 4600 patents and patent applications for the period May 1969 through June 1987. Additional indexes list personal authors, corporate authors, contract numbers, NASA case numbers, U.S. patent class numbers, and NASA accession numbers. Author

N87-27557* National Aeronautics and Space Administration, Washington, D.C.

NASA THESAURUS SUPPLEMENT (SUPPLEMENT 3)

Jul. 1987 325 p
(NASA-SP-7053(SUPP-3); NAS 1.21:7053(SUPP-3)) Avail: NTIS HC A14 CSCL 05B

The four part cumulative NASA Thesaurus Supplement to the 1985 edition of the NASA Thesaurus includes Part 1, Hierarchical Listing, Part 2, Access Vocabulary, Part 3, NASA Thesaurus Definitions, and Part 4, Changes. The semiannual supplement gives complete hierarchies for new terms.

Author

N87-30218*# National Aeronautics and Space Administration, Washington, D.C.

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS: A CATALOG OF SPECIAL PUBLICATIONS, REFERENCE PUBLICATIONS, CONFERENCE PUBLICATIONS, AND TECHNICAL PAPERS, 1977-1986

Sep. 1987 390 p
(NASA-SP-7063; NAS 1.21:7063) Avail: NTIS HC free as PR-655B; NASA Scientific and Technical Information Facility, P.O. Box 8757, BWI Airport, Md. 21240 HC free CSCL 05B

This catalog lists 2311 citations of all NASA Special Publications, NASA Reference Publications, NASA Conference Publications, and NASA Technical Papers that were entered into the NASA scientific and technical database during the decade 1977 through 1986. The entries are grouped by subject category. Indexes of subject terms, personal authors, and NASA report numbers are provided.

Author

85

URBAN TECHNOLOGY AND TRANSPORTATION

Includes applications of space technology to urban problems; technology transfer; technology assessment; and surface and mass transportation.

N87-70425* National Aeronautics and Space Administration, Washington, D.C.

SIGNIFICANT NASA INVENTIONS. AVAILABLE FOR LICENSING IN FOREIGN COUNTRIES

1977 103 p
(NASA-SP-7038(04); NAS 1.21:7038(04)) Avail: SOD HC \$5.00 as 003-000-00986-1; NTIS MF A01

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SPACE SCIENCES (GENERAL)

N87-23313*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

DOUBLE LAYERS IN ASTROPHYSICS

ALTON C. WILLIAMS, ed. and TAUNA W. MOOREHEAD, ed. May 1987 321 p Workshop held in Huntsville, Ala., 17-19 Mar. 1986; sponsored by NASA, Washington and USRA
(NASA-CP-2469; M-560; NAS 1.55:2469) Avail: NTIS HC A14/MF A01 CSCL 03B

CONFERENCES, ELECTRIC FIELDS, ENERGY TRANSFER, MATHEMATICAL MODELS, PLASMA LAYERS, PLASMA PHYSICS, SPACE PLASMAS

N87-24247*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

ESSAYS IN SPACE SCIENCE

REUVEN RAMATY, ed., THOMAS L. CLINE, ed., and JONATHAN F. ORMES, ed. Jun. 1987 424 p Symposium held in Greenbelt, Md., 23 Apr. 1985
(NASA-CP-2464; REPT-87B0055; NAS 1.55:2464) Avail: NTIS HC A18/MF A01 CSCL 03B

ASTROPHYSICS, CONFERENCES, COSMIC RAYS, GAMMA RAY ASTRONOMY, INFRARED ASTRONOMY, X RAY ASTRONOMY

N87-28471*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

CALCULATION AND ACCURACY OF ERBE SCANNER MEASUREMENT LOCATIONS

LAWRENCE H. HOFFMAN, WILLIAM L. WEAVER, and JAMES F. KIBLER Sep. 1987 34 p
(NASA-TP-2670; L-16218; NAS 1.60:2670) Avail: NTIS HC A03/MF A01 CSCL 03B

COMPUTATION, EARTH ATMOSPHERE, EARTH RADIATION BUDGET EXPERIMENT, POSITION (LOCATION), REMOTE SENSING, SCANNING

89

ASTRONOMY

Includes radio, gamma-ray, and infrared astronomy; and astrometry.

N87-14219*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

TEN YEAR PLANETARY EPHEMERIS: 1986-1995

F. ESPENAK Nov. 1986 249 p
(NASA-RP-1176; NAS 1.61:1176; REPT-86B0471) Avail: NTIS HC A11/MF A01 CSCL 03A

Accurate geocentric positions are tabulated at five day intervals for the Sun, Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune during the ten year period 1986 through 1995. The apparent angular diameters, radial velocities, declinations and mean times of meridian transit of the seven planets and the Sun are graphically depicted for each year in the interval. Appendices are included which discuss the theory of planetary orbits and a FORTRAN program for calculating planetary ephemerides.

Author

N87-22573*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

INFRARED SOURCE CROSS-INDEX, FIRST EDITION

MARION SCHMITZ (Computer Sciences Corp., Beltsville, Md.), JAYLEE M. MEAD, and DANIEL Y. GEZARI Apr. 1987 323 p
(NASA-RP-1182; REPT-87B0058; NAS 1.61:1182) Avail: NTIS HC A14/MF A01 CSCL 03A

The Infrared Source Cross-Index is a listing of correlated infrared source names (and positions) for astronomical objects observed at 1-1000 microns. The source names have been obtained from the database of the first edition of the Catalog of Infrared Observations (CIO: NASA RP 1118), covering observations published through 1982. Additional identifications were located by correlating these names with identifications contained in other machine-readable astronomical catalogs in the NASA National Space Science Data Center (NSSDC). There are some 80,000 different source names in the Cross-Index, corresponding to over 27,000 unique infrared sources.

Author

89 ASTRONOMY

N87-24266*# National Aeronautics and Space Administration, Washington, D.C.

STAR FORMATION IN GALAXIES

May 1987 755 p Conference held in Pasadena, Calif., 16-19 Jun. 1986
(NASA-CP-2466; NAS 1.55:2466) Avail: NTIS HC A99/MF E03 CSCL 03A

CONFERENCES, GALACTIC STRUCTURE, GALAXIES, INFRARED ASTRONOMY, MOLECULAR CLOUDS, RADIO ASTRONOMY, STAR FORMATION, STELLAR LUMINOSITY

N87-25906*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

FIFTY YEAR CANON OF SOLAR ECLIPSES: 1986 - 2035

FRED ESPENAK Jul. 1987 272 p
(NASA-RP-1178-REV; REPT-87B0252; NAS 1.61:1178-REV)
Avail: NTIS HC A12/MF A01 CSCL 03A

A complete catalog is presented, listing the general characteristics of every solar eclipse from 1901 through 2100. To complement this catalog, a detailed set of cylindrical projection world maps shows the umbral paths of every solar eclipse over the 200 year interval. Focusing in on the next 50 years, accurate geodetic path coordinates and local circumstances for the 71 central eclipses from 1987 through 2035 are tabulated. Finally, the geodetic paths of the umbral and penumbral shadows of all 109 solar eclipses in this period are plotted on orthographic projection maps of the Earth. Appendices are included which discuss eclipse geometry, eclipse frequency and occurrence, modern eclipse prediction and time determination. Finally, code for a simple Fortran program is given to predict the occurrence and characteristics of solar eclipses.

Author

90

ASTROPHYSICS

Includes cosmology; celestial mechanics; space plasmas; and interstellar and interplanetary gases and dust.

N87-30235*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

ATLAS OF COMET HALLEY 1910 II

BERTRAM DONN, JUERGEN RAHE, and JOHN C. BRANDT 1986 597 p
(NASA-SP-488; NAS 1.21:488; LC-86-16341) Avail: SOD HC \$48.00 as 033-000-00991-7; NTIS MF A01 CSCL 03B

With the impending return of Halley's Comet in 1986, a major effort began to collect the material obtained at its last appearance in 1910. This material displays the evolving coma and tail phenomena, and is useful for comparison with the present quantitative studies of spectroscopic and structural phenomena. Images in the atlas are arranged in chronological order by day. Days that have multiple images with varying scale are arranged in two sequences. Photographs showing tail phenomena are first, followed by photographs obtained with longer focus instruments showing the head or near-nuclear region. Drawings of Comet Halley, made from visual observations in 1835 and 1910, also are included.

B.G.

91

LUNAR AND PLANETARY EXPLORATION

Includes planetology; and manned and unmanned flights.

N87-17598*# National Aeronautics and Space Administration, Goddard Inst. for Space Studies, New York, N.Y.

THE JOVIAN ATMOSPHERES

MICHAEL ALLISON, ed. and LARRY D. TRAVIS, ed. Oct. 1986 129 p Conference held in New York, N.Y., 6-8 May 1985
Submitted for publication
(NASA-CP-2441; NAS 1.55:2441) Copyright Avail: NTIS HC A07/MF A01 CSCL 84B

ATMOSPHERIC CHEMISTRY, CLOUDS (METEOROLOGY), GAS DYNAMICS, GAS GIANT PLANETS, HYDROGEN, JUPITER ATMOSPHERE, NEPTUNE ATMOSPHERE, SATURN ATMOSPHERE, SPACE EXPLORATION, SYNOPTIC METEOROLOGY, THERMODYNAMICS, URANUS ATMOSPHERE

N87-19322*# National Aeronautics and Space Administration, Washington, D.C.

STATUS AND FUTURE OF LUNAR GEOSCIENCE

1986 63 p
(NASA-SP-484; NAS 1.21:484) Avail: SOD HC \$4.25 as 033-000-00997-6; NTIS MF A01 CSCL 03B

The Moon is of special interest among the many and diverse bodies of the solar system because it serves as a scientific baseline for understanding the terrestrial planets, its origin is closely tied to the early history of the Earth, and its proximity permits a variety of space applications such as mining and establishment of bases and colonies. Data acquisition and analysis have enabled advances to be made and the remaining questions in many fields of lunar geoscience to be identified. The status and unresolved problems of lunar science are discussed. Immediate needs, new unmanned missions, and a return to the Moon (a lunar base) are examined.

B.G.

92

SOLAR PHYSICS

Includes solar activity, solar flares, solar radiation and sunspots.

N87-19328*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

ENERGETIC PHENOMENA ON THE SUN: THE SOLAR MAXIMUM MISSION FLARE WORKSHOP. PROCEEDINGS

MUKUL KUNDU, ed. (Maryland Univ., College Park) and BRUCE WOODGATE, ed. Dec. 1986 423 p Workshop held in Greenbelt, Md., 24-28 Jan. 1983, 9-14 Jun. 1983, and 13-17 Feb. 1984
(NASA-CP-2439; NAS 1.55:2439) Avail: NTIS HC A18/MF A01 CSCL 03B

CONFERENCES, MAGNETOHYDRODYNAMIC STABILITY, SOLAR CORONA, SOLAR FLARES, SOLAR MAGNETIC FIELD, SOLAR MAXIMUM MISSION, SOLAR PHYSICS, SOLAR PROMINENCES, SUN, SUNSPOTS

N87-20871*# National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.

CORONAL AND PROMINENCE PLASMAS

ARTHUR I. POLAND, ed. Dec. 1986 435 p Workshop held in Greenbelt, Md., 9-11 Apr. 1985 and 8-10 Apr. 1986
(NASA-CP-2442; REPT-86BO536; NAS 1.55:2442) Avail: NTIS HC A19/MF A01 CSCL 03B

CONFERENCES, MAGNETIC FIELD CONFIGURATIONS, MAGNETOHYDRODYNAMIC STABILITY, MAGNETOSTATICS, PLASMAS (PHYSICS), RADIO ASTRONOMY, SOLAR

ATMOSPHERE, SOLAR CORONA, SOLAR MAGNETIC FIELD,
SOLAR PHYSICS, SOLAR PROMINENCES, SUN

N87-20947*# National Aeronautics and Space Administration.
Marshall Space Flight Center, Huntsville, Ala.

STATISTICAL ASPECTS OF SOLAR FLARES

ROBERT M. WILSON Apr. 1987 41 p
(NASA-TP-2714; NAS 1.60:2714) Avail: NTIS HC A03/MF A01
CSCL 03B

SOLAR FLARES, SOLAR PROMINENCES, STATISTICAL
ANALYSIS

N87-21785*# National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.

RAPID FLUCTUATIONS IN SOLAR FLARES

BRIAN R. DENNIS, ed., LARRY E. ORWIG, ed., and ALAN L.
KIPLINGER, ed. (Systems Applied Sciences Corp.-Technologies,
Landover, Md.) 1986 491 p Workshop held in Lanham, Md.,
30 Sep. - 4 Oct. 1985
(NASA-CP-2449; NAS 1.55:2449) Avail: NTIS HC A21/MF A01
CSCL 03B

CONFERENCES, MICROWAVES, OSCILLATIONS, PLASMA
PHYSICS, RADIO WAVES, SOLAR FLARES, X RAYS

93

SPACE RADIATION

Includes cosmic radiation; and inner and outer earth's radiation
belts.

N87-25984*# National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.

**COSMIC RAY HEAVY ION LET MAPPING FOR ALUMINUM,
SILICON, AND TISSUE TARGETS**

E. G. STASSINOPOULOS, J. M. BARTH, and T. M. JORDAN
(EMP Consultants, Northridge, Calif.) Apr. 1987 264 p
(NASA-RP-1180; REPT-87B0034; NAS 1.61:1180) Avail: NTIS
HC A12/MF A01 CSCL 03B

Linear energy transfer (LET) values in aluminum, silicon, and
tissue targets have been calculated for 31 galactic cosmic ray ion
species in eight different units. The values are described for single
event upset (SEU) effect assessments or radiobiological
evaluations. The data are presented in graphical and tabular
form. Author

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GENERAL

N87-24390*# National Aeronautics and Space Administration.
Langley Research Center, Hampton, Va.

**ENGINEER IN CHARGE: A HISTORY OF THE LANGLEY
AERONAUTICAL LABORATORY, 1917-1958**

JAMES R. HANSEN (Maine Univ., Orono.) Washington, D.C.
1986 643 p NASA History Series
(NASW-3502)

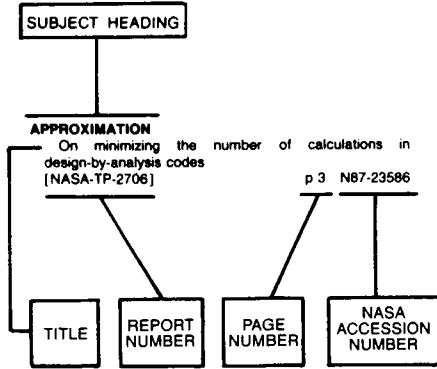
(NASA-SP-4305; NAS 1.21:4305) Avail: SOD HC \$30.00 as

033-000-00999-2; NTIS MF A01 CSCL 05B

A history is presented by using the most technologically
significant research programs associated with the Langley
Aeronautical Laboratory from 1917 to 1958 and those programs
that, after preliminary research, seemed best to illustrate how the
laboratory was organized, how it works, and how it cooperated
with industry and the military. B.G.

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Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of document content, a title extension is added, separated from the title by three hyphens. The accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document. Under any one subject heading, the accession numbers are arranged in sequence.

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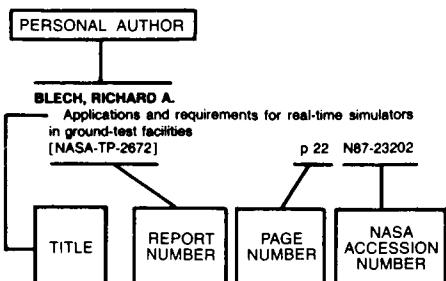
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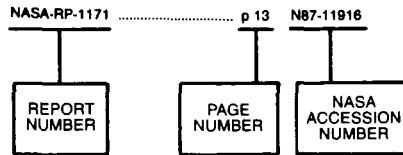
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